THE IRON TRADE REVIEW

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Consumers Are Clamoring for Quick Deliveries

Of Finished Materials and Many Are Willing to Pay Premiums—New Business Slack—More Price Advances

Pressure for deliveries of all kinds of finished products is the paramount feature of present conditions. Many mills cannot deliver plates and structural shapes in less than 90 days and some companies are unable to book any additional orders for the remainder of this year. Owing to the fact that a large percentage of the specifications submitted prior to July 1, on contracts expiring at that time, represented tonnages to be used for stock purposes, and because of the further fact that many consumers are fully protected through the year on contracts made at lower prices than now prevail, there is a lull in buying and it is not expected that the volume of new business will be large until indications concerning business conditions in the somewhat distant future become more positive. The extremely active demand for deliveries has greatly increased the volume of business for jobbers, some of whom, especially in the Chicago and Pittsburgh districts, are finding it difficult to deliver in less than a week. Labor shortage, particularly in the coke regions and in the foundries, continues to cause embarrassment and to curtail production.

Railroad Buying

Car builders report actual new inquiries in the market comparatively few. The Denver & Rio Grande is inquiring for 1,200 gondolas. The Grand Trunk has deferred closing on 2,000 box cars. The Harriman lines are understood to be considering the purchase of 4,000 cars additional. The Boston & Maine will undoubtedly buy a large block of cars before many months, but as yet has not put out formal inquiries. The cars for the Southern railroad will probably be placed this week. A fair tonnage of structural material is being placed by the railroads. The Lackawanna Steel Co. has taken 5,000 tons of rails for export to Manila.

Price Advances

Eastern mills advanced their quotations to 1.35c, Pittsburgh, on universal plates and 1.30c, Pittsburgh, for sheared plates for eastern shipment, while for western shipment, these prices are quoted at the eastern mills and are equivalent to 1.44c, Pittsburgh, on universals and 1.39c on sheared plates, or about $2 above the quotations of Pittsburgh mills. Considerably higher premiums are obtained on some shipments west of Pittsburgh. Prices of sheets are being advanced, but somewhat irregularly. As there is no co-operation, sheet makers are advancing according to the conditions of their order books. The advance of the leading maker on blue annealed of $1 per ton is being maintained. Some plants which have been compelled to go out of commission to make repairs are well supplied with orders and are quoting 2 cents on No. 28 black and 3 cents on No. 28 galvanized. The advance on hoops to 1.40c is $2 over the former maximum quotation and $3 over the price at which a large amount of business was done. The proposed advance on wire nails is not being received with favor by some buyers. The leading makers of sheet piling have advanced prices $2 per ton.

Pig Iron Stocks

Pig iron stocks continue to decline in spite of the heavy output of the blast furnaces. During the last half of June, accumulations of iron on the banks of merchant and steel-works furnaces in the Pittsburgh, valley, Ohio river and Ohio lake districts, not including the stacks of the Steel Corporation, declined about 20,000 tons, and the total stocks of the districts, which constitute the largest producing area of the country, are now about 540,000 tons. The suspension of steel-making by many companies for the Fourth of July and for two or three days following will probably result in some increase in stocks during the first half of the present month; but shut-downs, which sometimes last for a number of weeks during the heated season, are being greatly restricted this year.

Coke

The remarkable struggle between blast furnace operators and coke producers in regard to the price of coke for the last half of the year continues. In order to maintain their position of refusing to pay the $2.50 asked on contracts by the coke makers for high grade coke, some furnaces are taking coke of lower grades, including tonnages high in sulphur. Some coke, which was sold a few weeks ago at $2.10 and $2.15 by brokers, is not being delivered and furnaces are compelled to buy spot coke at from $2.50 to $2.60. The unusual demand for high sulphur coke has caused higher quotations in the smelter coke market. The reports of government prosecution of an alleged pool of coke makers are attributed to brokers who sold short on last half coke and are anxious to do everything in their power to break the present strong market. Some false rumors of banking of furnaces on account of coke shortage are current, but a few stacks may be compelled to suspend operations, if present conditions continue.

PITTSBURGH

Stubborn Struggle Over Coke Prices Continues

Office of THE IRON TRADE REVIEW,
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In many of the leading lines of finished material the iron and steel market continues to show satisfactory progress, both as to volume and general average in better prices, and while there is an evident lethargy in new buying for the time being, the strong buoyancy of the market appears sufficient to induce manufacturers to ignore the normal quiet season, and in several instances to advance prices on finished products, confident that the higher rates can be maintained. Notably is this true in track material, steel hoops, sheet piling and similar specialties together with pipe and iron products. Furnace operators are showing a halting tendency due to uncertain coke supply or to the high prices now prevailing for coke. The pig iron market is quiet, but very firm.

Pig Iron.—The market for pig iron has become lifeless during the past week. Yet it has maintained a firm position, so far as prices are concerned, and such furnaces as are operating show no disposition to weaken on the prices established for all grades now moving. Bessemer buying is extremely limited, with the exception of reported sales to the Steel Corporation, and these are understood to have been negotiated on the basis of $14.40, valley, but the tonnage has not been large. The basic situation has improved slightly through sales of fair-sized odd lots that have been sufficient to test the real strength of that market. One buyer closed for about 4,000 tons for shipment near Pittsburgh covering the third quarter, and another buyer closed some ten days ago quietly for approximately 10,000 tons, both sales being made on a basis of about $13.50, valley. The foundry iron demand is light for the time being, as consumers appear to be fairly well covered for immediate requirements, but such sales as are going indicate this iron is as strong as basic at $13.50, valley, as the universal quotation. Malleable sales, while very small, are also at $13.50, and whether a large sale would weaken this price or not appears to be matter for conjecture. The gray forge demand is apparently satisfied for some time ahead. Fourth quarter quotations are not definitely settled upon by many of the furnaces, the situation affecting the coke trade causing a general holding back of any definite prices for that late in the year until the furnace companies know positively what they must pay for their fuel supply. No activity is looked for in the iron market for a few weeks under such conditions as prevail. Some furnaces are reported to be banked, pending a more certain supply of coke and others are hesitating in blowing in until they are assured of their own supply of fuel. The market, therefore, is a nominal one for future business, any change to come being largely dependent upon the adjustment of difficulties in the coke trade that must be eliminated within the next few weeks. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	13.50
Basic, Pittsburgh	14.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.15

(Fourth Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, Pittsburgh	14.40
No. 2 foundry, Pittsburgh	14.40
Gray forge, Pittsburgh	13.90
Malleable, Pittsburgh	14.40

Ferro-Alloys. — The market for ferro-alloys is seasonably quiet, ferro-manganese being in very light demand, and the price for spot manganese softening somewhat, although the supply is not large. Foreign makers are very firm in their attitude as to forward delivery, prices holding to $48.50, Baltimore, and spot is selling in small quantities at about $50, Baltimore. Fifty per cent ferro-silicon is firm at $72.50 and quiet. Domestic grades are fairly active without change in price. It is understood that in the face of the somewhat quieter market, foreign makers of manganese are contemplating a further advance in the price governing the last half and future deliveries, which dealers say is not out of the ordinary rule in this market.

We quote ferro-manganese at $48.50, Baltimore, and $50 for prompt delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted nominally at $71 to $72.50, Pittsburgh, for prompt and $70 forward delivery; 12 per cent, $22; 11 per cent, $21; 10 per cent, $20, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

On ferro-titanium we quote 8 cents per pound for carload lots; 10 cents per pound for 2,000 pound lots and over, and 12½ cents per pound in lots up to 2,000 pounds.

Plates. — Specifications for steel plates continue heavy and the market is very strong, with makers, as a rule, much embarrassed in making shipments. There seems to be little let up in new tonnage, which is coming out quite freely, and inquiries for car material as well as ship material indicate a very healthy sentiment prevailing in those quarters. Among the new car inquiries are 2,000 cars for the Grand Trunk Railroad of Canada; 700 cars for the Virginia railroad, 700 cars for the Southern railroad and the Denver & Rio Grande is taking bids on 1,200 cars, as referred to last week. The Canadian Pacific railroad, while a large buyer of cars, in Canada, has found its needs greater than the Canadian builders can supply, and some inquiry has crossed over the line into this country, but the exact amount of business possible from that source is not yet determined. The ship building industry has sent out much new inquiry, that indicates a large tonnage for new vessels under consideration. Nearly all the makers are operating to capacity and have avoided any suspension for repairs, but are embarrassed at times from lack of labor in the mill yards, which is delaying shipments. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.30c. Extras are as follows per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches 0.10c; circles, 0.20c. Plates in widths over, 100 inches up to 110 inches 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including $\frac{7}{16}$-inch plate on thin edge, 0.10c; under $\frac{7}{16}$ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Sheets.—The advance in the price of blue annealed sheets of $1 a ton

to 1.45c for No. 10 gage caused no apparent change in the activity of this market for this grade of material, and specifications are coming in in the same satisfactory manner. The demand is strong for black sheets. Large buyers, in some instances seeking to extend contracts or place supplemental orders for round lots, have been met with the demand for better than market price, although they originally secured their business on lower than the nominal price. During the past week, sales of No. 28 gage black sheets have been made under these conditions at higher than the nominal market, one order of several hundred tons being placed as a supplemental contract at 2c, or $1 a ton higher than the nominal quotation. Galvanized sheets are extremely stiff at 3c, and there are rumors of an advance in that particular line, which if extended to the black sheet list, will add probably $2 to the galvanized price and $1 to the black sheet price, as now quoted, leaving the market at 2c for black sheets and 3.10c for galvanized. Nearly all the mills are receiving very heavy specifications and are considerably behind on deliveries. There are some reports of a shading of 1.95c on black sheets west of Pittsburgh, which seem to affect local conditions, but are not a general factor in the trade. We quote the market as follows:

Flat Sheets

Black Sheets.—Nos. 10-12, $1.60 per 100 pounds; Nos. 13-14, $1.65; Nos. 15-16, $1.70; Nos. 17-21, $1.75; Nos. 22-24, $1.70 to $1.80; Nos. 25-26, $1.75 to $1.85; No. 27, $1.90; No. 28, $1.95; No. 29, $2.00; No. 30, $2.10.

Blue Annealed.—Nos. 3-8, $1.40 per 100 pounds; Nos. 9-10, $1.45; Nos. 11-12, $1.50; Nos. 13-14, $1.55; Nos. 15-16, $1.65.

Galvanized.—Nos. 10-11, $2.00 per 100 pounds; Nos. 12-14, $2.10; Nos. 15-16, $2.25; Nos. 17-21, $2.40; Nos. 22-24, $2.50; Nos. 25-26, $2.70; No. 27, $2.85; No. 28, $3.00; No. 29, $3.10; No. 30, $3.30.

Roofing Sheets

Galvanized.

Net extras on all gages per 100 pounds. Corrugated 2-inch, 2½-inch, 3-inch and 5-inch corrugation, 5c; 2 V crimped without sticks, 5c; corrugated 1¼-inch corrugation, 10c, 3 V crimped without sticks, 10c; pressed standing seam with cleats, 15c; plain roll roofing with cleats, 15c.

Painted Roofing.

12 to 18 gage, inc., 5c; 19 to 24 gage, inc., 10c; 25 to 28 gage inc., 15c.

Tin Plate.—While new business in tin plate is at a low point at this season of the year, mills are operating to capacity on specifications which cover the requirements of large consumers for several weeks ahead, and in many cases through the third quarter. Such new business as is being booked is being taken at very firm prices, and in the case of the leading interest and some of the large independents, $3.50 per base box is the rule. Some independent manufacturers, however, will accept business for prompt shipment from $3.40 to $3.45, according to the character of the orders tendered them. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 to $3.50, f. o. b. mill, Pittsburgh district.

Rails and Track Material.—There is a quiet tone to the rail market at this time. While specifications are very satisfactory and mills are operating practically full, new buying is of a very restricted order and will likely continue so for the next week or so. This is particularly the case with light rails, and the mills are taking the present time for such repairs as are necessary in anticipation of an unusually active season. The leading interest is still burdened with open-hearth specifications in excess of its capacity and is drawing heavily on the open-hearth steel supply. Bessemer rails are more quiet and mills could very easily care for additional tonnage. Track material is in good demand. The recent advance of railroad spikes to 1.50c has had no apparent effect on the demand, which is above the capacity of all large makers, and for prompt shipment an additional $1 has been paid freely. With the enormous amount of tonnage coming out on spikes, it is believed that 1.55c will soon be the minimum price asked by makers. All track supplies are in good demand. The favorable season, which was somewhat late in opening for construction work, let out a large volume of business in excess of what was expected. The market is quoted as follows, with the base price on open hearth steel rails 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads and less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds; 1.15c, the schedule on the other weights being irregular and subject to negotiations; angle bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.00c to 2.20c, Pittsburgh.

Railroad Spikes

4½, 5 and 5½ and 9-16	$1.50 to 1.55
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x ⅞	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x ⅞	.60
2 x ⅞	.80

Steel.—The market for semi-finished steel is quite strong with inquiries for both small billets and sheet bars covering the third quarter that indicate a larger consumption than at any quarter of the year. The heavy demand, together with the crowded condition of the steel mills, makes the market very firm, and some sales of open-hearth sheet bars are reported at 50 cents above the high point of the past few weeks, or $23.50, Pittsburgh. There are reports of odd lots of Bessemer sheet bars going at $22.50 and $23, Pittsburgh, and Youngstown makers are holding the same prices with no concessions for Pittsburgh delivery. Most of the large makers are sold up on both billets and sheet bars, and some of them ordinarily in the market as producers are more or less frequent buyers of steel to meet their own requirements. Forging billets are firm at $28, Pittsburgh, and neither the leading interest nor independents appear to have any for prompt shipment.

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $22.00 to $23.00, with the usual extra for size and analysis, and open-hearth rolling billets, $22.50 to $23.00. Bessemer sheet and tin bars are quoted at $22.00 to $23.00, and open-hearth sheet bars are quoted at $22.50 to $23.00, f. o. b. Pittsburgh, for second quarter, with full freight to destination added. Forging billets are quoted at $27.50 to $28.00, Pittsburgh.

Hoops and Bands.—The demand for steel hoops and bands has continued without change with specifications running heavy and mills generally behind on shipments, although this is not yet a serious matter. The leading interest during the past week announced an advance in the price of steel hoops to 1.40c, Pittsburgh, which is $2 better than the former price demanded, but still leaving the price of steel hoops slightly out of line with the rest of the market. It is believed that this price will be firmly maintained owing to the general feeling that hoops have been too far down the scale to be profitable, and the sentiment of independent manufacturers as well as the leading interest has been strongly favorable to the new price. The price of bands has followed strictly on the card rate for merchant bars and the advance to 1.25c. It is generally firm at that figure. We quote the market as follows:

Hoops in carload lots, 1.35c to 1.40c, Pittsburgh; in less than carload lots, 1.50c; bands 1.25c, base, with net extras, as per standard steel.

Merchant Bars.—The demand for merchant bars is continuing on the broad order with the price of 1.25c being very rigidly held, and mills as a rule are somewhat behind on shipments. Specifications are coming in at a very heavy rate, and new business has broadened materially. In fact, it is much larger than is usually the case at this season. Some of the steel bar makers have avoided any suspension for mid-summer repairs on account of the exactions of buyers in making shipments. The steel shafting demand is a little less active, and, while specifying is fairly satisfactory, there are makers who could take care of more business without much

trouble. They are quoting 65 per cent off on car load lots and 60 per cent on less than carload lots on the business going. Iron bars are in good demand and the new high price of 1.40c is being well maintained, $1 shading of this price being rare at present. The higher cost of producing iron bar is having a tendency to bolster up the market considerably. We quote the market as follows:

Common iron bars, 1.35c to 1.40c, Pittsburgh; Bessemer and open-hearth steel bars, 1.25c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled, and ground shafting, 65 per cent off in carloads and 60 per cent in less than carloads, delivered in base territory.

Muck Bar.—There is a very strong tone to the muck bar market, and while the active demand is not yet large enough to make its effect felt sharply, there is a lack of stocks and the supply is diminishing, so that there is little difficulty in maintaining the prices, which are from $29 to $30, with some small sales reported at 50 cents above the high point. We quote, however, $29 to $30, Pittsburgh, for muck bar.

Structural.—The large amount of small tonnage that is coming into the structural market affecting Pittsburgh has rapidly filled the fabricators' shops, and with the estimating now being done on large sized orders, there is little complaint of lack of business. The industrial trade as well as railroad orders have been very active as buyers, and the greatest difficulty experienced at this time is in connection with deliveries because of the congested condition of the mills. The Riter-Conley Mfg. Co. has taken 1,400 tons for the Trumbull Steel Co. of Warren, O., and the Riverside Bridge Co. of Wheeling has been awarded a contract for the Owens Eastern Bottle Company's buildings at Clarksburg, W. Va., which will require about 1,000 tons. Inquiries are pending for 1,000 tons for the new plant of the Duff Mfg. Co., North Side, Pittsburgh, which will likely be awarded this week. Small building operations are appearing numerously in the structural market, and the great difficulty has been to convince the buyers of the necessity for earlier placing of orders to insure active building construction during the present season. Generally fabricators are asking and receiving better prices for their work. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.30c; tees, 1.30c; angles, from 3 to 6 inches, 1.30c; over 6 inches, 1.40c; universal and sheared, 1.35c; over 15 inches, 1.40c; plates, 6¼ inches wide and wider, 1.40c.

Merchant Pipe. — The demand for steel line pipe is very active, and nearly all makers are so seriously congested with business that they are withdrawing earlier quotations on contracts pending and are insisting on the new card rate for all business placed at this time. The advance in the price of all sizes of pipe has had some influence in the coming out of new business that had been pending, but this fact has not interfered with the position of the makers, some of whom welcome the chance to get caught up with their contract obligations, and in some instances buyers have been compelled to cancel contracts because of slow deliveries and go into the open market for immediate requirements at advanced prices. The merchant pipe demand is very large. A feature of this trade as well as in nearly all of the finished lines is the unusual activity and volume of business reported by the jobbers and warehouse interests, which have been called upon more freely to meet urgent needs of buyers who could not obtain satisfactory deliveries from the mills. In many instances, this form of buying has increased 25 per cent since the first of June. We quote the official discount of jobbers subject to the usual preferential discount to the larger buyer as follows:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch.....	73	53	68	48
⅜ inch	74	64	69	53
½ inch	77	67	72	59
¾ to 1½ inch.....	80	72	75	64
2 to 3 inches.....	81	74	76	65
	Lap weld.			
2 inches	78	71	72	63
2½ to 4 inches.....	80	73	74	66
4½ to 6 inches.....	79	71	73	65
7 to 12 inches.....	77	67	71	61
13 to 15 inches.....	54	..	47	..
Extra Strong, Plain Ends.				
	Butt weld.			
⅜, ¼, ⅛ inch.....	69	59	65	55
½ inch	74	68	70	63
¾ to 1½ inch.....	78	72	74	65
2 to 3 inches.....	79	73	75	66
Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	75	69	71	63
2½ to 4 inches.....	77	71	74	66
4½ to 6 inches.....	76	70	72	65
7 to 8 inches.....	69	59	65	55
9 to 12 inches.....	64	54	60	50
Double Extra Strong, Plain Ends.				
	Butt weld.			
½ inch	64	58	60	52
¾ to 1½ inch.....	67	61	63	55
2 to 3 inches.....	69	63	65	57
Double Extra Strong, Plain Ends.				
	Lap weld.			
2 inches	65	59	61	52
2½ to 4 inches.....	67	61	63	57
4½ to 6 inches.....	66	60	62	56
7 to 8 inches.....	59	49	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

The above discounts are for full weight pipe, subject to a variation of 5 per cent, merchant pipe, when specified, being furnished up to 6 inches at one point higher discount (lower price).

Boiler Tubes.—The demand for boiler tubes has been increasing so rapidly that most makers are now holding off on new business as much as possible. The question of deliveries is of more importance than that of price, and because of the great demand for seamless boiler tubes, which makers appear to be unable to meet, the iron tube trade has grown much stronger. A recent misfortune in Detroit closed a large producer plant because of fire, and has caused a scattering of business among the rest of the makers who are not well prepared to care for it, and this has caused the turn to the iron boiler tube makers for some relief. The result has been a stiffening of the market for charcoal iron tubes, and these mills are now struggling to maintain shipping orders to meet the desires of the trade, but are gradually losing ground. The locomotive tube demand is the dominant factor, being larger than for a long time. The general trade is also on a better basis.

We quote the official discount on steel and charcoal iron boiler tubes as follows:

	Steel.	Iron.
1¼ inch	60	48
1¾ to 2¼ inch.....	64	50
2½ inch	66¼	55
2¾ to 3¼ inch.....	71½	57½
3½ to 4½ inch.....	74	60
5 and 6 inch.....	66½	..
7 to 13 inch.....	64	..

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—There is a very satisfactory condition in the wire trade because of heavy specifying by jobbers and large consumers of wire nails and plain wire material. There is also considerable new business appearing in the market. Leading makers are adhering very rigidly to the established prices and are declining to extend contracts of buyers, although often urged to do so. There is some talk of a further advance in wire nails, but this action will not likely meet with approval, judging from the statements of large buyers who have been sounding the market during the past week. Plain wire is in good demand at 1.40c. There appears to be no reason for the mills to weaken on this price. Warehouse stocks are not large, and this will afford a considerable volume of buying for some time. We quote the market as follows:

Wire nails, jobbers' carload lots, $1.60; retailers' carload lots, $1.65; cut nails (western makers), jobbers' carload lots, $1.55 to $1.60, painted barb wire, jobbers' carload lots, $1.60;

retailers' carload lots, $1.65 with 30c for galvanizing; plain wire to jobbers in carloads, $1.40; and to dealers, in carloads, $1.45; polished staples, $1.60; galvanized staples, $1.90.

Wire Rods.—There is a better tone to the demand for wire rods. With the increased operations of mills, a slightly firmer price is noted where contracts have expired and new ones are sought. The general market is very firm at 50 cents higher than during the latter part of June, sales during the past week of small tonnages, it is reported, reaching $27, Pittsburgh. We quote, however, $25.50 to $26.50 for Bessemer and open-hearth wire rods.

Coke.—The struggle between the Connellsville coke producers and consumers of furnace coke over the price for last half contract supply continues to throw a damper on the activities of this market, and with producers still striving to maintain the new figure of $2.50 for standard furnace coke, the consumer has, to some extent, at least, turned to the lower grades to supplement the diminishing supply of standard material. One result of this has been a higher price being paid for high sulphur coke, the actual increase being from 20 to 30 cents a ton, or on the basis of $2, ovens, and better for coke that ordinarily is shipped to copper smelting interests. The spot market for the past week will probably aggregate 200 cars of standard coke, and these sales were around $2.50 and $2.60, ovens. A report of some other negotiations pending at $2.40 has not been confirmed. The increasing demand for the high sulphur coke has materially affected the smelter coke market, and is likely to continue to do so, for a brief period, the mixing of the low grades with the standard furnace coke being important in enabling furnaces to maintain fairly steady operations. The spot market for the moment is quiet. Inquiries are numerous, but sales are not completed on the high prices established. Foundry coke is somewhat more active, and firm at $2.50 to $2.60 for spot. A fair volume is moving. The Connellsville *Courier* for the week ending June 29 reports 30,561 ovens active with a production of 393,640 tons, as compared with 31,600 ovens active and a production of 373,729 tons for the previous showing, a gain of about 18,000 tons. Since that time, however, the intervention of Independence Day has reduced operations between 25 and 30 per cent. The forthcoming report will likely show considerable falling off in tonnage. We quote standard Connellsville furnace coke for spot shipment at $2.40 to $2.50, and on contract nominally at $2.25 to $2.50. For standard Connellsville foundry coke, we quote for spot shipment $2.50 to $2.60, ovens, and on contract from $2.50 to $2.75, ovens.

Old Material.—There is a fair amount of buying of old material, and dealers are satisfied that it prices were just a little lower, there would be no trouble in disposing of everything they could get in the way of scrap. The very firm position they take as to higher prices is causing a restricted movement in heavy melting steel as well as many other grades, because consumers of scrap are not disposed to load up at this time at these high prices. The heavy melting steel market remains stationary at $13.50 to $13.75. Buyers are taking lots of 500 tons and more at $13.50 where they can place them, and one large consumer is seeking to get some concession on a 5,000-ton order. Nearly all the large steel making companies are inquirers in the market and show great care in sounding the entire list. Re-rolling rails are somewhat firmer with a minimum of $14.25 to $14.50, and are very scarce. Old iron rails are also higher at $15.50 to $16. No. 1 wrought scrap is also firm at $13.75 to $14. Machine shop turnings are active and scarce. Nearly all the dealers are anxiously accumulating all they can and the price has advanced on a recent sale to $11 and $11.25. No. 1 cast scrap is also a little higher, being quoted at $13.25 to $13.50. While buyers are quite active, actual consumption is a little less, owing to the midsummer suspension of many works for a brief repair season. The fact that where plants have suspended temporarily, buying continues even more actively, indicates the real need of the market. We quote gross tons, delivered in the Pittsburgh district, including Monessen, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap	$13.50 to 13.75
Rerolling rails	14.25 to 14.50
Malleable	12.75 to 13.00
Bundled, sheet scrap	12.25 to 12.50
Iron axles	22.00 to 22.50
Old iron rails	15.50 to 16.00
Stove plate	9.00 to 9.50
No. 1 wrought scrap	13.75 to 14.00
Old car wheels	13.75 to 14.00
Low phosphorus	15.75 to 16.00
Machine shop turnings	11.00 to 11.25
Cast borings	10.00 to 10.25
No. 1 cast scrap	13.25 to 13.50

ST. LOUIS

More Active Inquiry for Pig Iron

Office of THE IRON TRADE REVIEW,
St. Louis, July 9.

Pig Iron.—The market for pig iron is much brighter this week than it has been for quite a while. Inquiries are out for a total of 3,500 tons, and one local representative reports scattering sales the latter part of last week of 1,500 tons. A flat price of $11.50 is generally quoted for southern No. 2, Birmingham basis, but one of the larger interests is holding firm at $12 for all deliveries.

Our tabulated prices, delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$15.50 to 16.00
Southern No. 2	15.00 to 15.60
Southern No. 3	14.50 to 15.00
Southern No. 4	14.00 to 14.50

Northern iron is quoted at $13 to $13.50, Ironton, with very little inquiry.

Coke.—A sale of 10,000 tons of foundry coke, in addition to the one of like amount reported Friday, has been made by the same local agent. With this exception, the market has been quiet. Prices are unchanged.

Finished Material.—Bids have been asked for about 4,500 tons of steel for the 20-story Monward building to be erected at Broadway and Olive streets. The demand for light rails continues fair, and structural material against contracts is active. Steel bars are quoted at 1.25c Pittsburgh. Plates and structural iron are held at 1.30c Pittsburgh. Plates are hard to get, and quick shipment is still demanded.

Old Material.—The market for scrap is rather off in tone, with the Tudor plant of the Republic Iron & Steel Co. shut down in East St. Louis indefinitely. Our tabulated prices on scrap follow:

Gross Tons

Old car wheels	$13.50 to 14.25
Old iron rails	15.25 to 15.50
Re-rolling rails (5 ft. and over)	13.25 to 13.75
Old steel rails (3 ft. and under)	12.25 to 13.25
Light section relayers (45 lb. and under) subject to inspec.	21.50 to 22.50
Relaying rails, subject to inspec.	22.50 to 23.25
Frogs, switches and guards	9.50 to 10.25
Heavy melting steel	10.50 to 11.25
Shoveling steel	9.75 to 10.25

Net Tons

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.25 to 13.50
Knuckles, couplers and springs	9.50 to 10.00
Shafting	13.00 to 13.50
Iron car axles	17.50 to 18.00
Steel car axles	15.00 to 15.50
Locomotive tires	10.50 to 11.00
No. 1 country wrought	8.75 to 9.25
Pipe and flues	8.00 to 8.50
Tank iron and cut boilers	7.00 to 7.50
No. 1 cut busheling	8.75 to 9.25
No. 2 cut busheling	5.75 to 6.25
Cast and mixed borings	5.75 to 6.00
Machine shop turnings	6.50 to 6.75
Railroad malleable	10.00 to 10.50
Agricultural, malleable	9.00 to 9.50
Stove plates	9.00 to 9.50
Angle splice bars (iron)	10.75 to 11.50
Angle splice bars (steel)	9.00 to 9.50

CHICAGO

Heavy Specifying Continues—Sheets Stronger

Office of THE IRON TRADE REVIEW, 1328 Monadnock Blk., July 9.

Very little activity has been experienced in adjusting buyers' over-specifications against contracts expiring July 1. Western producers have without exception either refused such business or carried it over at the new prices and no tonnage has been lost in the process. There is but a very slight falling off in specifications and the indications are that the tonnage for July will exceed May and possibly equal that for June. Due to the congested condition of mills, the usual shut-down for repairs has either been confined to a period of from one to three days or entirely omitted. Mills of the leading interest are continuing operation with no loss of time. The Inland Steel Co. shut down over the Fourth only and the Republic on July 4, 5 and 6. There is a noticeable improvement in the demand for sheets and specifications are very heavy, mill prices showing a small advance. Independent producers are still refusing to open their books for 1913 and are in a position to take practically no business for last quarter delivery. Railroad buying continues unabated with no indications of a secession in its activity. The tonnage of track fastenings purchased in the past 90 days has attained surprising proportions and exceeds that for a like period at any time in the history of the industry. This is due in part to the increased use of tie plates.

Pig Iron.—Although no advance in quotations on northern iron has materialized, the market is somewhat stronger, owing to better inquiries and the disappearance of shading on differentials between different grades. For some time the latter were either materially reduced or ignored, but owing to the increasing demand the proper proportion is being maintained at present. The situation is more satisfactory to the furnaces, as inquiries are appearing in greater numbers and for better tonnages. Due to increases in business, many melters are showing a disposition to come into the market for last quarter requirements, including many who were thought to be covered for the year. Southern iron is stronger and sales for larger quantities are reported. One sale of 3,000 tons of southern foundry at $12, Birmingham, for last quarter delivery, has been made, which is the largest for future delivery that has appeared so far. A sale of 1,000 tons is reported to a Wisconsin melter and a northern Illinois manufacturer has taken 500 tons. Another lot of 550 tons has been sold to a Chicago foundry. Inquiry in lots ranging from two carloads to 2,000 tons is appearing in good numbers and one for the latter amount has been sent out for last quarter delivery. Southern iron is firm on a basis of $11.50, Birmingham, and the disposition of the furnaces seems to be to advance the price in this territory as soon as a like move is made by the northern producers. A number of sales of northern iron have been made in from 1,000 to 2,000-ton lots and a prominent manufacturer of gas engines is in the market for a good tonnage for last quarter. While there is no advance in quotations on charcoal iron, inquiries are increasing and sales are very satisfactory.

The following prices represent the market for Chicago delivery, for the remainder of the year, except northern foundry and malleable Bessemer, which are quoted f. o. b. local furnace.

Lake Superior charcoal	$15.75
Northern foundry No. 2	14.50
Southern foundry No. 2	15.85
Southern silv'ries, 5 per cent sil.	16.35
Jackson co. silveries, 8 per cent	18.35
Malleable Bessemer	14.50
Alabama basic	15.60

Billets.—Western producers continue to be a negligible factor in the billet market and the heavy demand for finished lines has the effect of materially decreasing the amount available for sale. While there is plenty of business offered, no local mill has been in a position to take it for some time, and billets have been shipped long distances to Chicago. While there is no advance in quotations, the price is very firm.

We quote, open-hearth forging billets, $28; re-rolling billets, $24.50.

Merchant Bars. — The demand for bars continues heavy at the new price, with increasing tonnage in specifications. Much business has been carried over at the higher quotations. Mills in general are refusing all tenders of business at the old prices in excess of the tonnage called for in contracts and no producers have lost business thereby. Iron bars are considerably stronger and while there is some business obtainable at 1.25c, the current quotation is strong at 1.30c and in several instances 1.35c has been obtained for small shipments. Mills are full for the remainder of the year and no new business is being sought. Shafting is still quoted at 65 per cent off list for carloads and 60 per cent for less than carloads, and is very firm at that price. The demand for store material is increasingly heavy and the market is materially stronger.

We quote, f. o. b. Chicago, as follows:

Bar iron, 1.25c to 1.35c; hard steel bars, rerolled, 1.30c to 1.35c; soft steel bars, bands and small shapes, 1.43c; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c; shafting 65 per cent off list for carload lots, 60 per cent off for less than carloads.

On iron and steel from local stock we quote, as follows:

Bar iron, 1.60c to 1.70c per pound base; soft steel bars, 1.70c to 1.75c per pound base; soft steel hoops, 1.90c to 2.00c, full extras.

Structural Material. — There have been no developments of unusual interest during the week. Fabricators continue to quote better prices wherever possible and specifications against contracts show no decrease. The advance in shapes has been fully justified by increasing offers of new business and deliveries continue to be the paramount issue. The total tonnage of structural contracts taken during the week is very small, aggregating but 1,815. This includes a contract for 289 tons taken by the American Bridge Co., for the Orpheum theatre at Salt Lake City, and 306 tons taken by the Pennsylvania Steel Co. for lock gate No. 1, on the Mississippi river, between St. Paul and Minneapolis. Wendnagel & Co. have taken 296 tons for the Lanski theatre building, Thirty-first and Indiana avenue, Chicago, and the Modern Steel Structural Co. has taken 627 tons from the Cedar Rapids & Iowa City Railway Co., for through and deck plate

girder spans. A contract has also been let for 297 tons of material by Richard Pinhorn, Denver, for a building in that city. The railroads are specifiying for structural material in increasing amounts and much new business, as indicated by improvements under consideration, is in prospect.

We quote, mill prices, f. o. b. Chicago, as follows:

Beams and channels, 15 inch and under, 1.48c. For extras, see Pittsburgh report.

Store prices are as follows:

All angles, 3 inches and larger, including 6 inches, $1.80 to $1.85 per 100 pounds; angles over 6 inches, $1.85 to $1.90 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.80 per 100 pounds, base; channels, 3 inches and larger, $1.80 per 100 pounds, base.

Rails and Track Fastenings. — The congestion of the rail mills is becoming almost serious and the open-hearth capacity has proved decidedly inadequate to meet requirements. Bessemer rails have been substituted wherever possible. An increasing amount of business is being offered in track fastenings, which are very strong at new prices. Western mills have been unable to consider the larger tonnages offered and are farther behind on deliveries than are many eastern producers. The Peoria & Southern has ordered 6,000 tons of rails from the Illinois Steel Co. and the Louisville & Nashville has ordered 12,000 tons of rails from the Tennessee Coal, Iron & Railroad Co. The Pere Marquette will soon be in the market for 5,000 tons of 90-pound rails and inquiries aggregating 12,000 tons have appeared from two western roads.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 25 to 45-pound, 1.20c to 1.25c; 16 to 20-pound, 1.25c to 1.30c; 12-pound, 1.30c to 1.35c; 8-pound, 1.35c to 1.40c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.60c to 1.65c, smaller size spikes, 1.70c base; track bolts with square nuts, 2.00c to 2.05c base.

Plates.—No difficulty has been experienced in settling claims of buyers in cases of over-specifications, western producers without exception either refusing such business or carrying it over at the new prices. Mills in the Chicago district are full for the year and independent producers are refusing to open their books for 1913 at present prices. There has been very little falling off in specifications, the present indications being that the tonnage for July will exceed May and probably equal that for June. On account of their congested condition, many mills have postponed the usual shut-down for repairs and others have confined it to a period of from one to three days. There seems to be no limit to car building activities and the railroads are buying in undiminished quantities. The Southern Railway is again in the market for 650 box cars and 150 flat cars in addition to its previous requirements and the Oregon Electric Railway has invited bids for 25 60-foot electric passenger coaches and six 60-foot electric combination passenger and baggage cars. The Grand Trunk is also in the market for 2,000 30-ton box cars and 30 tank cars. The Northern Pacific has ordered 10 switching locomotives from the American Locomotive Co.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6⅝ to 100 inches wide, 1.48c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, $1.80.

Sheets.—Considerable activity is displayed in the sheet market and prices are much stronger. The volume of specifications is very heavy, being almost on a par with the tonnage of plates. Mills are even further behind on deliveries and while in this territory they are able to take some business for last quarter, are not actively seeking it.

We quote, f. o. b. Chicago, as follows from stock:

Blue annealed, No. 10, 2.10c; No. 12, 2.15c. Box annealed, No. 28, 2.45c. Galvanized, No. 28, 3.55c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products. — Agricultural wire continues to lead other wire products in volume of sales and in any business offered. The demand is increasing daily and while some business has been taken at a slight shading of price, the quotations are firm on a basis of 1.78c.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98; painted barb wire, jobbers' carload lots, $1.78; retailers' carload lots, $1.88; retailers' less than carload lots, $1.98, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.58; retailers' carload lots, $1.63.

Merchant Pipe and Tubes.—Makers in this territory are considerably behind on delivery, but are expecting to be in a better position in the near future. New business continues at an undiminished rate and prices show increasing strength.

We quote, store prices on merchant pipe and tubes, as follows:

Iron and Steel Pipe Basing Prices

	Steel. Black	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt.				
⅛ inch and ¼ inch.	70.2	49.2	63.2	42.2
⅜ inch	74.2	63.2	68.2	52.2
½ inch to 1½ inch.	77.2	68.2	71.2	59.2
Lap.				
2 inch	75.2	67.2	68.2	58.2
4½ inch to 6 inch..	76.2	67.2	59.2	60.2
Card Weight.				
7 inch to 12 inch...	73.2	62.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch.....	65.2	53.2	60.2	48.2
½ inch	70.2	58.2	65.2	53.2
2 inch to 3 inch....	75.2	63.2	....	....
Lap.				
2 inch	71.2	59.2	66.2	54.2
7 inch to 8 inch...	65.2	53.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	58.2	46.2	....	....
¾ inch to 1½ inch.	61.2	49.2	....	....
Lap.				
2 inch	59.2	47.2	....	....
4½ inch to 6 inch..	60.2	48.2	....	....
7 inch to 8 inch....	53.2	41.2	....	....

Tubes.

	Lap weld steel.	Charcoal iron.	Shelby seamless.
	Per cent.	Per cent.	Per cent.
1 inch	38	..	56½
1¼ to 2¼ inch.....	54	39	34
2¾ to 3¼ inch.....	64	49	45
3½ to 4½ inch.....	66½	49	45
5 to 6 inch.....	54	..	..

Cast Iron Pipe.—While buying is less active than formerly, due to the fact that the majority of cities have purchased the bulk of their requirements, inquiries are appearing for fair tonnages and prospects for a record year are bright. Cincinnati, O., closed bids for 2,200 tons of water pipe July 10. While no other sales of appreciable tonnage have been reported, the total of the scattering orders taken is very good.

We quote, f. o. b. Chicago, as follows:

Four-inch water pipe, $27.50, 6 to 12 inches, $25.50, larger sizes, $25.00; gas pipe, $1 a ton higher.

Old Material.—The scrap market is characterized by continued weakness and railroad lists, while not large, are in sufficient quantities to have an appreciable effect. Stocks secured against car shortage early in the year in many cases have not been materially reduced, causing a tendency to retard active buying. The labor scarcity continues to be a factor in the situation and while there is some apparent improvement, this is due rather to unabated efforts on the part of employers rather than to any increase in supply. There is a shading on a considerable number of items and notably on railroad wrought, which continues to be the principal item of railroad

offerings. The Baltimore & Ohio has asked for bids on a list of considerable tonnage, of which the principal items are 500 tons of No. 1 railroad wrought; 500 tons of No. 2; 650 tons of cast iron scrap and 1,500 tons of re-rolling rails. A list issued by the Wabash includes 120 tons of cast iron scrap; 90 tons of malleable; 185 tons of No. 1 railroad wrought and 155 tons of No. 2. The Southern railroad has issued a large list, of which the principal items are 575 tons of No. 1 railroad wrought and 1,900 tons of re-rolling rails. A small list issued by the Mobile includes 55 tons of No. 1 railroad wrought and 20 tons of cast iron scrap. A list issued by the St. Louis & San Francisco Railroad Co., aggregating 482 tons, of which the principal items are 100 tons of No. 1 railroad wrought, 50 tons of No. 2 brake shoes and 40 tons of No. 2 drillings and borings.

We quote, for delivery in consumers' yards, Chicago, as follows:

Gross Tons

Old car wheels	$13.25 to 13.75
Old iron rails	16.50 to 17.00
Rerolling rails (5 ft. and over)	13.00 to 13.50
Old steel rails (3 ft. and under)	12.50 to 13.00
Frogs, switches and guards	11.75 to 12.25
Heavy melting steel	11.50 to 12.00
Shoveling steel	11.50 to 12.00

Net Tons

No. 1 R. R. wrought	$11.75 to 12.25
No. 2 R. R. wrought	10.75 to 11.25
Arch bars and transoms	15.25 to 15.75
Knuckles, couplers and springs	11.75 to 12.25
Shafting	14.50 to 15.00
Iron car axles	19.00 to 19.50
Steel car axles	15.50 to 16.00
Locomotive tires	13.50 to 14.00
Dealers forge	10.00 to 10.50
Pipe and flues	8.75 to 9.25
No. 1 cast	11.75 to 12.25
No. 1 busheling	9.75 to 10.25
No. 2 busheling	7.25 to 7.75
No. 1 boiler cut	8.25 to 8.75
Boiler punchings	12.50 to 13.00
Cast and mixed borings	6.25 to 6.75
Machine shop turnings	7.00 to 7.50
Railroad malleable	11.75 to 12.25
Agricultural malleable	10.50 to 11.00
Angle bars, splices, etc., iron	14.00 to 14.50
Angle bars, steel	11.25 to 11.75
Stove plate and light cast scrap	10.00 to 10.50

CLEVELAND

Jobbers Advance Store Prices of Sheets

Office of THE IRON TRADE REVIEW, Penton Bldg., July 9.

Iron Ore.—Although iron ore is being shipped at an unprecedentedly heavy rate, the sales have been unusually heavy and independent interests are beginning to fear that they may not be able to ship all the ore that has been sold. Undelivered ore will be cancelled as provided in the contracts. The Steel Corporation is shipping a larger percentage of ore than usual, owing to the great activity on the Hill properties, and the independents are not making as good a showing as the statistics of the ore movement might be considered to indicate. Furnace operators who have not yet fully covered for their requirements express the opinion that they will be able to get all the ore that they need, but there is a very limited supply of Bessemer ore and not a great quantity of non-Bessemer. Prices are much firmer than they were at the opening of the season and sellers are not willing to make the concessions that were granted at the height of the ore selling movement.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $3.75; Mesabi Bessemer, $3.50; old range non-Bessemer, $3.05; Mesabi non-Bessemer, $2.85.

Pig Iron.—The pig iron market is quiet and no sales of large tonnages in this territory are reported. The prices are firm and furnaces are hoping for an advance. The Ella furnace, at West Middlesex, Pa., will be blown in in about 40 days, on foundry iron. We quote, delivered in Cleveland, for the remainder of the year, as follows:

No. 1 foundry	$14.25
No. 2 foundry	13.75
No. 2 southern	15.60
Gray forge	13.25
Bessemer	15.15
Lake Superior charcoal	15.75
Jackson co. 8 per cent silvery	$17.55 to 18.05

Coke.—There is moderate activity in foundry coke for last half delivery and $2.75, ovens, is the prevailing price. There is considerable speculation as to what course will be pursued by furnaces not protected by contracts for the last half, but up to the present time they are not willing to contract at $2.50, the price generally demanded by the coke makers. Reports of concessions below this price are occasionally heard, but only limited tonnages seem to be obtainable at less than $2.50. We quote:

Connellsville furnace coke, $2.25 to $2.60 for prompt delivery, and $2.25 to $2.50 on contract; Connellsville foundry coke, $2.75 for prompt, and $2.75 on contract.

Finished Material.—As a large percentage of the specifications on contracts expiring July 1, was for finished materials for stock, and as many consumers are covered by contracts at low prices running up to Oct. 1 and Jan. 1, there is very little new buying and it is not expected that there will be much activity in the near future. Protection is being given at present prices to buyers who are bidding on specific contracts, but there is very little general contracting. The demand for bar iron is greatly improved and the Cleveland mills have received a large number of orders within a few days. The sheet market has improved and most of the sales made are at the maximum quotations. Eastern mills are quoting 1.35c mill, or 1.44c Pittsburgh, on plates and shapes and consumers in Ohio are paying from $2 to $5 premium for prompt deliveries. Promises of deliveries are being extended by the mills. Eastern mills are able to deliver universal plates in from four to six weeks and sheared plates in from two to three weeks. Jobbers are extremely busy and have advanced prices on sheets $2 per ton. Present prices out of store are 1.75c on bars, 1.85c on plates and shapes, 2.20c on No. 10 blue annealed sheets, 2.25c on black No. 28 and 3.60c on galvanized No. 28.

Old Material.—Several steel plants have come into the local market for heavy melting steel, offering the prevailing market quotation. Because of the difficulty of employing men to unload stock from the cars, buyers are not attempting to obtain stock for immediate delivery. Dealers continue to complain about the scarcity of yard labor, and report that many men have refused to work on account of the heat. Most of the dealers are holding out for higher prices. Stock from outside towns is moving very slowly, it being almost impossible to buy tonnages of any amount. A num-

ber of inquiries for busheling are reported, although no sales have been made. Inquiries for cast scrap have been numerous, and advanced prices are offered in several instances. Turnings are in good demand, and prices are somewhat better than offered a week ago. No changes in quotations are noted. We quote, gross and net tons, f. o. b. Cleveland, as follows:

Gross Tons.

Old iron rails	$15.00 to 15.50
Old steel rails (under 6 ft.)	13.00 to 13.50
Old steel rails (over 6 ft.)	13.50 to 14.00
Relaying rails	19.50 to 20.00
Old car wheels	13.00 to 13.50
Old steel boiler plate	10.50 to 11.00
Malleable iron (railroad)	12.50 to 13.00
Steel axles	18.00 to 18.50
Axle turnings	13.00 to 10.50
Malleable iron (agricultural)	10.00 to 10.50
Heavy steel	12.25 to 12.75
Country mixed steel	11.00 to 11.25
Bundled sheet scrap	10.00 to 10.50

Net Tons.

No. 1 R. R. wrought	$12.00 to 12.50
No. 1 busheling	10.50 to 11.00
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	7.75 to 8.00
Pipes and flues	9.50 to 10.00
Wrought drillings	7.75 to 8.00
Stove plate	9.50 to 10.00
Cast borings	7.75 to 8.00
Wrought iron piling plate	14.50 to 15.00
Wrought iron arch bars	14.00 to 14.50

CINCINNATI

Prices of Pig Iron Slowly Growing Stronger

Office of THE IRON TRADE REVIEW,
503 Mercantile Library Bldg., July 9.

Prices on southern pig iron are growing stronger and have advanced slightly during the past week. The lowest quotation on southern No. 2 foundry iron is now $11.25, Birmingham basis, for spot or third quarter shipment, and $11.50 for the last quarter, but some interests are holding for $11.50 for prompt iron, and $12 for the last three months of the year. Now and then sales are made on small lots on the $11, Birmingham basis, for No. 2, but they are fast disappearing. In some cases, these latter consist entirely of resale iron, which was purchased for speculation when prices were $10 or $10.50 earlier in the year, and which must be sold at once owing to the fact that those buyers who still need iron during the last half of the year are beginning to look for it, and also the furnaces from which it was purchased are beginning to ship it. Actual furnace iron, though, upon which the market price really is based, has been selling this week for $11.25 to $11.50 for third quarter delivery by those interests which were offering it for $11 last week.

Although the inquiry in the market is very light, some of the local firms have been doing a good business during the past week. This is because of the fact that a large number of the buyers are not sending out regular inquiries, but are going into the market and quietly contracting, generally for small lots, which in the end will total a fair tonnage. Furnace interests are showing a more and more independent attitude, and have withdrawn certain grades from the market, or are limiting the tonnage to be sold at the present quotations, as they predict that prices will continue to advance during the rest of the year. There is at present a decided shortage of low grade iron in the south, and users of gray forge and southern No. 4 are already being forced to take certain amounts of Nos. 2 and 3 at higher prices than they would ordinarily be asked to pay for the lower grades.

The southern Ohio situation is scarcely stirring, and very little buying and selling are being done on the Hanging Rock grades here. There is practically no inquiry in the market, and the few sales being made are mostly for small lots. Consequently prices have not changed, and are still $13.50, Ironton. They are, however, apparently growing stronger as the furnaces in this district have not closed as yet for their coke requirements for the coming year, and prices on furnace coke are gradually being advanced.

In all, the inquiries in the market here at present are at a minimum. A central Indiana melter is still in the market for 1,000 tons of southern special analysis iron, which is of such a character that furnace interests are having a hard time to meet the requirements. There is also an inquiry for 1,000 tons of No. 3 iron from northern Indiana, and 500 tons of southern foundry iron from northern Ohio. Recent sales include 1,000 tons of charcoal iron for July to December delivery for $22.50; 1,200 tons of special analysis iron for shipment into Michigan, and 500 tons of malleable and 450 tons of southern iron to separate users in northern Ohio.

Another Jackson county interest has advanced its price on 8 per cent silicon iron to $16.50 furnace, but this same grade is still being offered at $16 or $17.20, Cincinnati. With freight rates $3.25 from Birmingham, and $1.20 from Ironton, we quote Cincinnati prices as follows:

Southern foundry No. 2	$14.50 to 14.75
Southern foundry No. 3	14.00 to 14.25
Southern foundry No. 4	13.75 to 14.00
Southern gray forge	13.25 to 13.50
Mottled	12.75 to 13.60
Southern No. 1 soft	15.00 to 15.25
Southern No. 2 soft	14.50 to 14.75
Standard southern car wheel	25.50 to 25.75
Northern No. 2 foundry	14.45 to 14.70
Northern No. 3 foundry	13.95 to 14.20
Northern No. 4 foundry	13.70 to 13.95
Jackson co. 8 per cent silicon	17.20 to 17.45

Coke. — Prompt shipment foundry coke has been advanced in price during the past week, and is now quoted at $2.50 in the Connellsville district and at $2.60 in the Wise county fields. Contract coke remains practically the same in the former territory at from $2.50 to $2.75, while in the latter it is being quoted at from $2.60 to $2.75. There is little or no change in the prices on furnace coke, as practically none has been sold in this immediate territory for some time, owing to the deadlock still existing between furnace and coke interests. A few good contracts for foundry coke have been placed by local dealers during the past few days, and there are still one or two fairly large consumers in this territory still uncovered for the coming year. A southern furnace operator recently contracted through a Cincinnati dealer for from 35,000 to 40,000 tons of Wise county coke to be shipped during the next year. The inquiries of the Hanging Rock furnaces are still in the market, but these interests refuse to pay the present prices. In all, there still remain inquiries for approximately 90,000 tons of furnace coke in the local market. We quote from the leading coke producing districts as follows:

Connellsville district.	Prompt shipment.	Contract second half.
Foundry coke	$2.50 to 2.60	$2.50 to 3.00

Furnace	coke.....	2.40 to 2.50	2.35 to 2.50
Wise county district:			
Foundry	coke.....	$2.60 to 2.75	$2.60 to 2.75
Furnace	coke.....	2.25 to 2.40	*Sliding [scale basis
Pocahontas district:			
Foundry	coke.....	$2.25 to 2.50	$2.50 to 2.75
Furnace	coke.....	2.00 to 2.25	2.25 to 2.50
New river:			
Foundry	coke.....	$2.50 to 3.00	$3.00 to 3.25
Furnace	coke.....	2.15 to 2.25	2.35 to 2.50

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16 2-3 per cent of the amount over $9 which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—The local rolling mill has advanced its price $2 a ton on galvanized sheets, which is directly due to the continued high price of spelter. The former quotation on galvanized sheets, No. 28 gage, up to the time of the above advance, was 3c, Pittsburgh basis. Black sheets, No. 28, are still quoted at 1.95c, Pittsburgh. The mill has done a very good business lately, and now has orders on its books that will include deliveries well into the next six or eight months.

It has been definitely decided by those in charge of the construction of the new Gibson house, this city, to use concrete to larger extent than at first proposed, and only about 300 or 400 tons of steel will be required, most of which will be reinforcing bars.

Steel bars are quoted at 1.25c and structural at 1.30c, and local offices report a very good business. Specifications are coming in in good order, and mills are reported several months behind on deliveries. For mill prices, see Pittsburgh report.

Warehouse business is good, despite the fact that prices were advanced last week. Several good contracts have been closed during the past few days, which extend over the the next six months, and which call mostly for building materials. Orders are fairly well distributed over the entire list carried in stock by local houses. We quote warehouse prices, f. o. b. Cincinnati, as follows:

Steel bars, 1.75c base; iron bars, 1.70c base; structurals, 1.85c base; plates, ¼ inch and over, 1.85c base; sheets, blue annealed No. 10, 1.95c base; rivets, cone head, 2.30c base; cold rolled shafting, 60 per cent discount; boiler tubes as follows: 1¾ to 2¼ inch, 60 per cent discount; 2½ inch, 62 per cent discount; 2¾ to 3¼ inch, 65 per cent discount; 3½ to 4½ inch, 67 per cent discount; and 5 to 6 inch, 60 per cent discount; cold rolled shafting, 60 per cent discount; soft steel cold twisted concrete bars, cut to length as follows: ¾ inch square and larger, 1.85c, ⅝ inch square and larger, 1.95c; ½ inch square and larger, 2.05c; 5-16 to ⅜ inch square and larger, 2.25c; ¼ inch square and larger, 2.35c.

Old Material.—The scrap iron market here is practically stationary, and although prices have perhaps weakened a little more during the past week, they have not changed to any extent. There is not much buying and selling in Cincinnati direct, and most of the business being done by local dealers is outside of the city. Several of the large users of scrap in this territory have closed down for repairs, and others generally have a good supply in their yards, as dealers moved considerable iron last month. Dealers here, therefore, are not pressing business with local melters at the present time, as they prefer to wait until some of this surplus scrap is used up, which may cause prices to stiffen a little. Heavy melting steel is being quoted at $10, and mixed cast scrap at $8, these quotations being the lowest on these grades, as they are occasionally bringing from 25 to 50 cents a ton more, depending entirely upon the conditions of the sale. We quote prices dealers will pay in Cincinnati and vicinity as follows:

Gross Tons

Old iron rails	$12.50 to 13.25
Old steel rerolling	11.00 to 11.50
Old iron axles	17.50 to 18.00
Heavy melting scrap	10.00 to 10.50
Relaying rails	20.00 to 21.00
Bundled sheet scrap	8.50 to 9.25

Net Tons.

Old No. 1 R. R. wrought	$10.25 to 10.75
No. 1 machinery cast	10.25 to 11.00
No. 1 busheling	8.00 to 8.75
Stove plate	7.00 to 8.00
Machine shop turnings	6.50 to 7.00
Cast borings	6.25 to 6.75
Heavy turnings	7.00 to 7.50
Mixed cast	8.00 to 9.00
Malleable	8.00 to 8.50

BUFFALO

Mill Books Almost Swamped

Office of THE IRON TRADE REVIEW, Buffalo, July 9.

Pig Iron. — The situation is very quiet indeed, with little inquiry and the consumers apparently not interested in future purchases just at this time. It, however, is the usual mid-summer dullness, for otherwise the situation continues very firm. Prices hold rigidly to the basis to which they were recently advanced, and shipments by the furnaces absorb the maximum tonnage that can be produced.

Furnace No. 2 of the Susquehanna group, owned by Rogers, Brown & Co., Buffalo, was put out of blast on July 6, for repairing.

The only change in prices was the extension of the range on basic and malleable. The schedule of prices for the week, f. o. b. furnaces, is substantially as follows:

No. 1X foundry	$14.25 to 14.75
No. 2X foundry	14.00 to 14.25
No. 2 plain	14.00
No. 3 foundry	13.75 to 14.00
Gray forge	13.50 to 14.00
Malleable	14.25 to 14.75
Basic	14.25 to 14.75
Charcoal	15.75 to 17.50

Finished Material. — The extensive specifying on contracts, to get them in before the first of the month, has almost swamped the books of the mills. It will be several weeks before the mills will be able to get their bearings on this large tonnage, so as to be in a position definitely to designate deliveries. Ninety days is now the best to be had on plates in some quarters. Hoop steel has taken the expected advance. It was 1.25c base and is now 1.40c, or a raise of $3 per ton. Merchant pipe in sizes over 7 inches is up $2, and blue annealed sheets have advanced $1. An advance on wire and wire products is contemplated.

The activity in structural material continues. Bids are being figured on the factory addition for the William A. Rogers Co., Niagara Falls, N. Y., requiring now about 200 tons and 700 or 800 tons later; Simons & Lark, Elmwood avenue, Niagara Falls, N. Y., are the architects.

Competitive plans are being prepared for the brick and steel warehouse and freight houses of the Buffalo Terminal Warehouse Co., just organized, requiring from 1,000 to 1,400 tons. Thomas E. Hannahan, Buffalo, will be general manager. The company leased 700 feet street frontage and 700 feet water frontage from the Erie railroad and the C. & B. Line. The city, on July 15, will open revised bids for the new Hutchinson High School, requiring about 500 tons.

Old Material.—Lack of local demand continues to characterize the Buffalo scrap market, with here and there a few small tonnage sales. Pittsburgh and eastern Pennsylvania came in for the bulk of the week's business, buying in carload lots. Price schedules hold as previously quoted, the yard operators continuing to stand out for better prices. The range for the week, in gross tons, f. o. b. Buffalo, is as follows:

Heavy melting steel	$12.75 to 13.25
No. 1 railroad wrought scrap	14.00 to 14.75
No. 1 R. R. and mch. cast scrap	13.50 to 14.00
Old steel axles	16.50 to 17.25
Iron axles	21.00 to 22.00
Car wheels	12.75 to 13.25
Railroad malleable, scrap	11.50 to 12.25
Wr'ght iron and soft steel turn.	8.00 to 8.50
Cast iron borings	7.00 to 7.50
Low phosphorus steel scrap	15.75 to 16.00
Old iron rail	15.00 to 15.50
Tank iron	10.00 to 10.25
Boiler plate, sheared	13.75 to 14.25
Pipe and tank	9.50 to 10.00
Stove plate	9.75 to 10.00
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

PHILADELPHIA

Further Price Advances in the East

Office of THE IRON TRADE REVIEW, Philadelphia, July 9.

Price advances are still featuring the eastern iron and steel market. Universal plates and structural shapes have been put up another $1 a ton to 1.35c, Pittsburgh, by some eastern mills. Common chain has gone up $2 a ton. These advances are due to the heavy specifications the mills are working upon and to receding deliveries which are being further extended by labor shortages. Pig iron prices also reflect the advancing movement, which is being hastened by increased labor and coke costs. The price of No. 2 foundry is establishing itself on a $15, eastern Pennsylvania furnace, basis. Eastern low phosphorus iron is up $1. With a number of mills in the midst of their annual shut down, scrap is quiet.

Pig Iron.—The direct effect of the higher coke market and of the advances in furnace wages is now more clearly shown in the price schedules of eastern iron producers. There has been more apparent during the past week the determination of makers to put the market on a minimum basis of $15, furnace, for No. 2X, equivalent to $15.75, Philadelphia. Two or three makers have been quoting this price for several weeks, but within the past week there has been a more general movement of other furnaces to this level. That the market has not yet been established at this price is evident, however, from the fact that one buyer in this district was able to close for a considerable tonnage, eastern Pennsylvania, of No. 2X, at $15.35, delivered. Some offers by furnaces at $15.50 still remain open, but these are not expected to long prevail. Lebanon valley No. 2X is held at $15.80, Philadelphia. One Lehigh valley maker has gone 50 cents beyond the hitherto highest price to $15.50, furnace, or $16.25, Philadelphia, and reports having made some small sales at this figure. A typical case of higher costs among eastern furnaces shows an increase of 80 cents per ton computed at the very favorable figure of $2 coke, which very few eastern furnacemen are assured of at present. New business in the market is not heavy excepting the steady buying of the cast iron pipe makers, but the sales made show better prices in practically all grades. One Delaware river pipe maker has closed for about 3,500 tons of northern and Virginia lower grades at $14.90 and $15, delivered. Another has covered fully against recent inquiries of 5,000 to 6,000 tons. Standard forge brought $14.75, furnace, or $15.50, delivered, on a lot of 2,000 tons to an eastern buyer for third quarter and other sales at this same price are noted. The seller of a 6,000-ton block of basic for last quarter at $15.50, delivered, which was reported last week, is asking $15.75 for further iron for this delivery. The buyer in question is still in the market for about 5,000 tons for last quarter. A small sale of off-basic at $15, delivered, is noted. The leading maker of Lebanon low phosphorus iron has advanced prices $1 a ton to $17, furnace. Small sales of standard low phosphorus have been made at $20.25, Philadelphia. Several good-sized sales of this grade are reported to this district, one of 3,500 tons of eastern Pennsylvania and New York state brands for last half and another of 1,200 tons of Lebanon iron.

We quote for third and fourth quarter, delivered to consumers' plants in Philadelphia and vicinity, as follows:

Eastern Pa. No. 1X foundry	$15.75 to 16.00
Eastern Pa. No. 2X foundry	15.50 to 15.75
Eastern Pa. No. 2 plain	15.25 to 15.50
Standard gray forge	15.00 to 15.50
Basic (Eastern and Central Pa.)	15.25 to 15.50
Virginia No. 2X	15.80 to 16.05
Southern No. 2	15.00 to 15.25
Standard low phosphorus	20.00 to 20.25

Coke.—A number of the eastern furnaces are uncovered by last half contracts and show no disposition to commit themselves for such a period at the $2.50 oven, price of Connellsville makers. Some of them will continue to buy spot coke even at a $2.50 price in the expectation that the market will sag later. That they are not obliged to pay such prices in all cases is shown by offers this week of fair-sized lots of Connellsville for prompt shipment at $2.20, ovens. Some furnaces are using mountain, Latrobe and Virginia cokes more freely.

Finished Material.—So heavy is the tonnage of specifications against contracts expiring July 1 and of new business recently taken, now on the books of eastern steel makers, that they are more indifferent to additional bookings and are asking further price advances on some of the most-sought lines. A leading eastern plate mill, effective at the close of last week, advanced universal plates $1 to 1.35c, Pittsburgh, and is taking no business under six weeks. There is a heavy demand upon eastern mills for universal plates and this is coming from all sections, from Canada and from abroad. On sheared plates, which can be promised in three to four weeks by this mill and more promptly by other eastern makers, the 1.30c, Pittsburgh, price still prevails. In standard shapes, some of the eastern mills are so heavily filled with specifications that they are asking $1 more, or 1.35c, Pittsburgh, equivalent to 1.50c, Philadelphia. A little business has been taken at this price. Steel chains have been advanced $2 a ton, making ⅜ inch, proof-coil grade, 3.15c, Pittsburgh. Some selling of steel bars at 1.25c, Pittsburgh, is reported. Bar iron is quiet owing to the cessation of mill operations. Eastern billet makers are well filled with business and are quoting $22, Pittsburgh, on rolling, and $27 and $28, Pittsburgh, for forging billets.

Labor shortages continue very common in the eastern industry. One steel plant did not close on the Fourth at all, fearing the scatterment of its men. Generally, however, iron and steel plants in the east were down from Wednesday night until Sunday night or Monday morning. Some of the iron mills will be idle for repairs until July 15.

While generally there is improvement in fabricating prices in this district, some work is still being placed under $50, erected. The American Bridge Co. has finally taken 3,600 tons for the new Fairmount or Adelphia hotel, this city, as it is now to be known, and also 1,000 tons for an extension of the plant of the Hale & Kilburn Mfg. Co., this city. No decision has yet been reached on the 3,000 tons of Reading work, this city, and on the 8,000 to 10,000 tons for

the C. & O. pier at Newport News. Bids go in July 15 on 2,000 to 3,000 tons of fabricated material for the Panama canal. The Garrett building, Baltimore, 500 tons, a Y. M. C. A. building on the west side, Philadelphia, 200 tons or more, and the Chamber of Commerce, Richmond, about 500 tons, are up for bids. The Jones & Laughlin Steel Co. has taken about 1,000 tons of reinforcing steel bars for Panama. The 2,500 tons of car material for the Southern railroad is still pending.

We quote, delivered to consumers' plants in Philadelphia and vicinity, as follows:

Plain structural shapes, 1.45c to 1.50c; tank plates, 1.45c to 1.50c; steel bars, 1.35c; common bar iron, 1.30c to 1.35c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage 1.55c to 1.60c; 4 x 4-inch open-hearth rolling billets, $24.40; forging billets, $29.40 to $30.40. Extras shown under Pittsburgh report. Philadelphia warehouse prices 1.75c for plates, shapes and bars.

Ship Building Work.—A Delaware river ship yard has taken six coal barges for the United States government, requiring about 5,000 tons of steel, of which 3,000 tons of plates will be furnished by an eastern mill. Some large ship building contracts still remain pending in the east and the yards, at present practically without exception, are working full with a heavy tonnage upon their books.

Old Material.—With many of the iron mills shut down and with the operation of most of the steel works interrupted by the holiday week, the scrap market shows little life. Under the light demand, No. 1 railroad wrought has weakened about 50 cents, but steel axles and stove plate have brought higher prices. Steel scrap is inactive. The Pennsylvania railroad has disposed of its June list and was able to obtain $13.75, delivered and over, on its heavy steel. Other railroad lists will close this week. We quote gross tons, delivered at consumers' plants in eastern Pennsylvania and western New Jersey, as follows:

Old iron rails	$16.50 to 17.00
Old steel rails (rerolling)	14.75 to 15.25
No. 1 heavy melting steel	13.50 to 13.75
Old car wheels	13.75 to 14.25
Old iron axles	23.00 to 24.00
Old steel axles	18.00 to 18.50
No. 1 railroad wrought	15.00 to 15.50
Wrought pipe	12.50 to 13.00
Cast borings	9.75 to 10.25
Machine shop turnings	10.75 to 11.25
Heavy cast	13.50 to 14.00
Malleable	11.75 to 12.25
Stove plate	10.75 to 11.25
No. 1 forge	12.00 to 12.50

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are: $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

NEW YORK

Higher Quotations on Finished Materials

Office of THE IRON TRADE REVIEW,
1115 West Street Bldg., July 9.

Iron Ore.—The foreign ore movement to eastern furnaces is not especially heavy at present. During the past week, four cargoes arrived at Philadelphia, one each from Spain, Sweden, Cuba and Nova Scotia. As the furnaces are pretty well covered on their present basis of operations for some months, there is not much interest in new purchases, but shipments are going forward steadily.

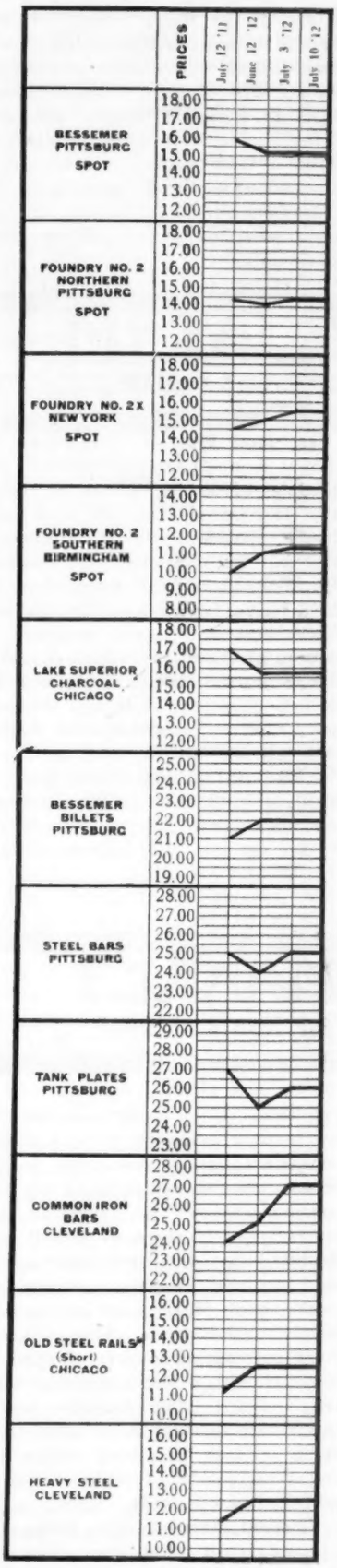
Pig Iron. — New business in the metropolitan market in pig iron has been comparatively scant during the past week and the influence of the holiday still overhangs the market. At the moment, the pending tonnage is light. A Connecticut radiator manufacturer has closed for 1,000 tons of No. 2X for forward shipment. An eastern soil pipe maker, which has been buying for New York State, New Jersey and Maryland plants, has closed for about 5,000 tons of No. 2 plain and lower grades for third quarter and last half, already reported in part. The major buying was done for a New York state plant. Prices, on the whole, are firmer and show an advancing tendency, but the market is not without the presence of some concessions. Lehigh, Schuylkill and Lebanon Valley makers, as a rule, are quoting $15, furnace, and higher for No. 2X iron, but some sales have been made from these districts fully 50 cents below these furnace levels. Now and then New England interior buyers are able to shade $16, delivered, for No. 2X, but quotations there generally approximate the range of $16 to $16.50, delivered. Some low prices are ascribed to an upper New York state maker. Some small sales of eastern Pennsylvania iron to New England points at $16.80, delivered, are noted. The Virginia Iron, Coal & Coke Co., the leading Virginia maker, today announced an advance effective at once of 25 cents a ton. This maker is sold up on July iron and its schedule is now $13.25, furnace, for 2X, $13, for No. 2 plain and $12.75 for lower grades for August and September. Its quotations had been $13, furnace, for No. 2X, for third quarter, $13.50, for last quarter, or $13.25, for all of last half. We quote, delivered at tidewater, for prompt and third quarter shipment, as follows:

Northern foundry No. 1	$15.50 to 16.00
No. 2X foundry	15.25 to 15.75
No. 2 plain	14.75 to 15.00
No. 2 Virginia	15.80 to 16.05
No. 2 southern foundry	15.00 to 15.25
Malleable	15.50 to 15.75
Gray forge	14.75 to 15.00

Ferro-Alloys. — Reports of price concessions having been made on forward ferro-manganese are coming out of the middle west where two consumers are understood to have closed for 500 tons each for last quarter and second quarter of next year, respectively, at considerably below the established price of $48.50, seaboard. Standard English ferro-manganese, however, from all advices, is holding firmly at $48.50, seaboard, for forward shipment, and some sizeable sales for delivery through the first half have been made in the east during the last few days at this price, while small prompt lots have sold at $50, Baltimore, this week. Sellers of German ferro reported the $48.50 price as being maintained except in special cases. The reported concessions are attributed to sales by middlemen. Ferro-alloys in general show only moderate activity. We quote standard English ferro-manganese at $48.50, seaboard, on contracts, and $50, seaboard, for prompt delivery, and 50 per cent ferro-silicon at from $70 to $73, Pittsburgh.

Cast Iron Pipe.—New public lettings in the east are few, but there continues active buying of a private character and all the pipe shops along the Delaware river are operating on very full schedules. One of these plants in the past week or ten

PRICE CHART



days has closed for about 10,000 tons for private consumers. Prices show some improvement, but this movement continues spasmodic. We quote 6-inch pipe at from $21 to $22, f. o. b. New York, in carload lots, with some makers asking up to $23.

Finished Material.—There is more buoyancy, apparently, to the finished prices than has been displayed by the market for a long time. This condition is supported by the large additions to unfilled tonnage upon mill books which have been made through recent active specifying against unfilled contracts. Steel makers without exception are now in very comfortable position on rolling orders and as much of this business represents specifications against lower priced contracts, there is more disposition to get as high prices on new business as the market will stand where the favorable deliveries can be made. Structural shapes have sold in the east for early shipment at $1 advance or 1.35c, Pittsburgh, and one eastern mill reports this is now its asking price. On some classes of plates, 1.35c, Pittsburgh, is also quoted. Makers are having little trouble to get 1.25c on steel bars and small angles. In steel hoops, an advance to 1.40c, Pittsburgh, was made this week, which is equivalent to practically $3 a ton from the former basis at which business was being taken. Sheet bars, mixed Bessemer and open-hearth, have been sold by lake mills in territory competitive with Pittsburgh district makers at $23.50, Pittsburgh.

Fabricated prices in the metropolitan market show evidence of sharp improvement. On bids entered the past week, quotations of over $50, erected, on loft construction, and over $60, erected, on apartment houses, were being made. These prices represent fully $10 to $15 over the levels prevalent during the times of very keen competition several months ago, when close to $40 and $50 a ton, erected, respectively, was done on such classes of work. With some fabricated shops now heavily filled, deliveries run to 12 weeks. Fabricators show a disposition at present to avoid quoting on the tonnage basis and to take work at lump sums instead.

Elevated railroad and subway construction now being planned in the metropolitan district will require fully 350,000 tons of steel, according to reliable estimates. These projects, however, have many preliminaries yet to be worked out and the fulfillment of such an enormous requirement will probably extend into the next two or three years at least. Some parts of this work, however, will probably be before the market by fall.

In railroad lettings the Chesapeake & Ohio railroad has finally closed for the construction of a large pier at Newport News, Va. The steel requirements, about 6,400 tons, will be distributed, it is said, to give the Pennsylvania Steel Co. about 5,500 tons and the Virginia Bridge & Iron Works 800 to 900 tons. This railroad has also awarded 200 tons of tanks and towers to the Des Moines Bridge & Iron Co. The New York Central railroad has awarded 800 tons of bridge work to the Ft. Pitt Bridge Works, including 200 tons for a bridge at White Plains, N. Y., and seven other small spans. It has also distributed among independent shops about 2,000 tons for work in the terminal area, this city, but has still pending, as far as known, a 1,500-ton bridge at Oswego, N. Y. The Pennsylvania Steel Co. has a 200-ton bridge at Rahway, N. J., for the Pennsylvania railroad. The Central of New Jersey railroad is still taking bids for its new ferry house and train sheds, at Jersey City, 4,500 to 5,000 tons. The Long Island railroad is preparing plans for further extensive grade crossing improvements and will soon be out for 5,000 tons or more.

Other awards include 1,000 tons for the loft candy factory on Broome street, to the Radley Steel Construction Co.; 1,000 tons for the Tishman apartment, 101st street and West End avenue, to the Hedden Iron Construction Co.; about 1,000 tons for the Zobell loft on West Thirty-ninth street, to the Hinkel Iron Works; 535 tons to the Lehigh Valley Structural Steel Co., for the Townsend-Holding Co. apartment at 640 West End avenue and about 600 tons to the same fabricator for the Connor loft at Thirty-first street and Fourth avenue; 400 tons to L. F. Shoemaker & Co., for the Edison Electric Co. service plant at Dorchester, Mass., and 200 tons to the same fabricator for the superstructure for piers 3 and 4 of the Pennsylvania railroad, at Baltimore, and 300 tons to the Virginia Bridge & Iron Works for the British-American Tobacco Co. building, at Richmond. Bids have gone in for 900 tons for the Mayer apartment at West End avenue and Eighty-third street. Plans are being prepared for the Fullerton-Wheeler Realty Co. apartment at Sixty-sixth street and Park avenue, 600 tons to 700 tons, and for a 20-story building at 46 to 53 Broad street for the 50 Broad Street Co., involving consid-

erable tonnage. Revised plans for the Eighth Artillery armory, originally designed for about 7,000 tons, will not be out for three or four weeks. We quote delivered at New York tidewater as follows:

Plain structural shapes, 1.46c to 1.51c; tank plates, 1.46c to 1.51c; steel bars, 1.41c; common iron bars, 1.30c to 1.35c; steel bars from store, 1.80c; plates and shapes from store, 1.90c; extras as shown under Pittsburgh report.

Old Material.—Large orders for scrap being placed by eastern steel mills and other heavy consumers are exceptional, but some good-sized transactions in heavy steel are being put through this market at the prevailing range of values. Other grades are showing no especial movement. The market is overloaded with cast scrap and the yards in the metropolis and vicinity have accumulated large tonnages. The scrapping of the Poughkeepsie Iron Co. plant will place about 2,000 tons on the market. We quote, gross tons, prices New York dealers will pay at tidewater, as follows:

Old car wheels	$11.75 to 12.00
Old iron axles	20.00 to 21.00
Steel axles	15.25 to 15.75
Old steel shafting	13.75 to 14.00
No. 1 heavy melting steel	11.25 to 11.50
No. 1 R. R. wrought	13.25 to 13.50
Wrought pipe	10.00 to 10.25
Cast borings	7.25 to 7.50
Machine shop turnings	8.25 to 8.50
Heavy cast	11.00 to 11.25
R. R. malleable	10.00 to 10.50
Stove plate	8.25 to 8.50
Grate bars	7.25 to 7.50

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J.; $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York; to Jersey City, $1.00 from New York; to Newark $1.10 from New York.

BIRMINGHAM

Increasing Tonnage of Pig Iron Sold at $12

Office of THE IRON TRADE REVIEW, Birmingham, Ala., July 9.

Pig Iron.—A lot of 7,500 tons of Nos. 2, 3 and 4 foundry, for last quarter delivery, was sold in the past week, and report is made of the sale of a round tonnage of similar grades for export, although specific information as to this last is not obtainable. The first lot referred to was sold through an eastern office, and brought a basis of $12 per ton at Birmingham for No. 2 foundry, which was the consideration in the majority of transactions recorded where carloads and lots of 100 to 150 tons each, all for early delivery, were sold. It is generally conceded that the $11.50 per ton basis is now obtainable from one concern only, notwithstanding the recent additions to the rate of production. Within the week, one stack that has been idle for some months was blown in, while by a change in operations the output at another plant was increased some 300 tons per day. In addition to this, still another stack is scheduled to go in blast July 20.

As was expected, the week as a whole was rather quiet, although the inquiry that came forward within that time involves some 20,000 tons. Of the tonnage pending, 3,000 tons is for prompt delivery; 5,000 tons for shipment in the third quarter, and prices have been asked on some 10,000 tons for shipment through the first quarter of 1913. It is quite improbable that this last would be considered by any of the producing interests, while certain of the producing interests refuse to quote on spot deliveries, and on third quarter shipments, owing to the present condition of order books. Stock figures as of July 1, are not yet compiled, but, as has been previously stated, the rate of shipment during June was in practically all cases larger than the daily output at the several operations. It is estimated that the aggregate tonnage on hand July 1, which includes basic and warrant iron, was less than 100,000 tons.

The market is considered correctly represented by the prices below, for any delivery in the remainder of the year, ultimate selling prices depending largely upon the nature of individual requirements. Quotations are per gross ton, f. o. b. cars at Birmingham district furnaces:

For delivery during the remainder of the year:

No. 1 foundry	$12.50
No. 2 foundry	11.50 to 12.00
No. 3 foundry	11.00 to 11.50
No. 4 foundry	10.50 to 11.00
Gray forge	10.25 to 10.75
Mottled	10.00 to 10.25
Standard basic	10.75 to 11.25
Off basic	10.50 to 10.75
Standard charcoal	22.50 to 23.00

With the exception of charcoal iron, an advance of 25c to 50c per ton would be asked over the above figures for deliveries in the last quarter.

Cast Iron Pipe. — This market is without items of especial interest. The schedule of asking prices is being fully maintained, and all local producers consider the outlook very favorable for additional new business. Operations have been resumed at all plants closed down for July 4th, and forwardings are again normal. A revision of quotations, which is due to change in the differential asked for the larger sizes, is made, and the market for water pipe is quoted as follows, per net ton, f. o. b. cars here, viz.: 4-inch, $23.50; 6-inch and up, $21.50, with $1 per ton extra for gas pipe. Special fittings are quotable at $50 per net ton, f. o. b. cars at foundry.

BRITISH MARKET

Tremendous Pressure for Iron and Steel

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., June 29.

Pig Iron.—Prices of pig iron have this week taken a sudden bound, which has brought them to a higher position than has been touched for the past five years. Yesterday's selling price was 57s 6d ($14.08) for No. 3, a gain of 7d on the day, and there was an animated market. For three months sales, an advance of 8d on these prices is asked for. One reason for the rise is the intervention of the London speculator. A few days ago, a London house bought 20,000 tons of warrants. This latest advance brings the price 7s 3d above the figure of three months ago, while the rate of advance is higher than it has yet been. It is freely rumored that the London purchase is for American consumers, but the rumor has not yet been confirmed. Exports of pig iron continue exceptional, and Connal's stores are now down to 314,000 tons. British consumers are inquiring for their autumn supplies. During the week about 65,000 tons of warrants have changed hands. The market is much strengthened by scarcity of coke, which is still considerably below requirements. The hematite market is very strong, and more furnaces are being put into blast both on the East and West coasts. Production has established new records.

Finished Material.—The pressure of demand is so great that some very desirable orders are going to foreign

houses. For example, the Hull Corporation reported a few days ago that they had decided to use German rails, owing to the difficulty of obtaining British tenders. It is known that a great deal of Australian work is finding its way to Germany, for the same reason. The Sheffield Corporation has been obliged to curtail its tramway extension program, owing to inability of the British steel mills to turn out rails within a reasonable time. A great deal of the congestion is due to the strikes, but it is recognized that the world's demand for steel has overtaken the supply. The British railways are buying more heavily than for several years past, and their demands are likely to increase. Shipbuilders are also taking very heavy quantities of material. Billet prices are not increasing, although they are firm at £5 17s 6d to £6. A small quantity of Belgian steel is on offer, but British buyers will not be tempted by this figure, in view of the stringent conditions in regard to cash payments and other matters attached to foreign purchases.

METAL MARKETS

Marked Scarcity of Tin—Copper Drops

New York

July 9.

Copper.—The London speculators have again been hammering the market and forced it down £2 and apparently will be able to force it down still further. On the morning cable, standard copper was lower by £3 3s 9d, but it recovered later on the favorable figures of the Copper Producers' Association. The total production in June, despite the fact that it was a short month, was 4,400,000 pounds smaller than in May, and this is the reason why stocks decreased as they did, for on July 1 the total stocks of copper, considered as the producers' returns, were 44,365,000 pounds, a decrease of over 5,000,000 pounds during the month. There is little to worry about in this decline. There is a heavy demand and consumers will again buy when they need copper. At present, there is no buying and the figures are more or less nominal. Resale lots are offered at 17 cents.

Tin.—The tin situation is most perplexing. There is practically no tin in this country except that which was brought in by the Potsdam on July 3, but everybody appears to have a little of this tin. It has been sold and resold almost times without number, and the peculiar thing is that notwithstanding the scarcity and the fact that everybody knows that there is only a little tin in the country, the price declines. On Monday sales were made for 45¼ cents and today the market is barely steady at 45 cents.

Lead.—The American Smelting & Refining Co. advanced its quotation for shipment lead late on the afternoon of July 3. The present price is 4.75 cents, New York, and it is scarce, no Omaha being available for July delivery. Outside interests are asking 4.60 cents St. Louis or 4.75 cents New York.

Spelter.—The market is steady at 7.10c, New York, and 6.95c, St. Louis.

Antimony.—Prices are higher, Cookson's selling at 8.12½c; Hallett's at 7.75c, and outside brands at 7.37½c to 7.50c.

Chicago

July 8.

New Metals. — New metals are stronger and the volume of business is constantly increasing. Due to the increased demand for iron and steel products, there is an increased amount of business in non-ferrous metals, which are used in conjunction with the former in machinery and in other lines.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 17½c; casting, 17½c; smaller lots, ¼c to ¾c higher. Spelter, car lots, 7c; lead, desilverized, 4.40c in 50-ton lots; corroding, 4.70c to 4.75c; sheet zinc, 8.75c, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 48.25c; Cookson's antimony, 8½c; other grades, 7½c to 8c.

Old Metals.—There is a fair demand for old metals in this territory and the list is as a whole firm. While there is a shading on some items, this is neutralized by increasing strength on others.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 14¾c; copper bottoms, 13¼c; heavy cut crucible copper, 14¾c; heavy red brass, 12¾c; heavy yellow brass, 10c; No. 1 red brass borings, 11c; No. 1 yellow brass borings, 9c; brass clippings, 9¼c; lead pipe 3¾c; zinc scrap, 4¾c; tea lead, 4c; No. 1 aluminum, 13½c; No. 1 pewter, 28c; block tin pipe, 41c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $90 a ton.

STEEL WORKS

In East are Preparing to Blow in Furnaces.

The Bethlehem Steel Co. will blow in an additional furnace at South Bethlehem in about a week and will then have its full group of six stacks in blast. This maker is absorbing practically all its iron made by its increased finishing operations and is not an actual seller of merchant metal at present. The Pennsylvania Steel Co. plans to blow in an additional furnace at Steelton some time this month, which will also establish full operations at this group. The Reading Iron Co. is about to put out a furnace. Scarcity of furnace labor in the east is so pronounced that the resumption of stacks now slated may be delayed.

Blast Furnaces Sold for Scrap

The plant of the Poughkeepsie Iron Co., Poughkeepsie, N. Y., consisting of two blast furnaces, has been sold by the receiver, Edward S. Atwater, to an old material dealer who will scrap the buildings and equipment. The plant consists of two furnaces originally built in 1860 and rebuilt in 1893, and has not been in operation since 1903. More recently it has been in the hands of a receiver. A. E. Tower is the president of the company, having inherited the business from his father, Albert E. Tower, who established the plant.

Ore Receipts at Lake Erie Ports

Out of a total movement of 7,567,555 tons of iron ore during June, 5,816,493 tons went to Lake Erie ports, distributed as follows:

Port.	June, 1912.
Buffalo	687,283
Erie	41,124
Conneaut	1,419,562
Ashtabula	1,202,135
Fairport	283,320
Cleveland	1,291,475
Lorain	630,134
Huron	94,161
Sandusky	.....
Toledo	158,572
Detroit	98,727
Total	5,816,493

IMPORTANT AMENDMENT

Was Not Included in Eight Hour Law—Importance of Construction.

Washington, July 9.—It is the opinion of James A. Emery, general counsel for the National Council for Industrial Defense, and others who have given thought to the matter, that it would not be wise to start agitation for a construction or interpretation of any part of the recently enacted eight-hour law. If forced to construe the act now, during a presidential campaign, the attorney general might find it difficult to ignore political considerations.

The statute may be construed to be one of the most drastic acts ever placed upon the statute books or it may be interpreted in such a way that it will not prove much of a disturbance to business.

According to the language used in the senate amendments, the act does not apply to any supplies purchased by the government. The meaning of that exception will depend wholly upon the definition given to the word "supplies" in contradistinction to "materials or articles" to which the act does apply.

It is not necessary for a man to be a lawyer to see the foolishness of forcing Attorney General Wickersham to construe the statute at this time. It goes without saying that, having in view the success of his chief, he would be constrained to give to the word "supplies" the meaning which would be most acceptable to the labor organizations. In other words, he would be inclined to decide everything in the way they would decide, were they in his place.

Another collection of words, the meaning of which will have to be declared, is to be found in the fifth exception. In that exception, it is declared no penalty shall be imposed for any violation due to "extraordinary conditions of manufacture" or to any emergency caused by fire, famine, or flood, or by danger to life or property, and the president may subsequently declare the violation due to any "other extraordinary event or condition" to be "excusable."

A mere statement of these points is sufficient to indicate how unwise it would be to force Attorney General Wickersham to declare how the government will construe the language when it is necessary to come to a conclusion so that the executive officers of the government may know what to do.

Necessity for a construction of the language employed will not arise until after the November election. There is no question as to what the senate intended by inserting the half dozen exceptions. It intended to rob the law of its most drastic features. Defeat was impossible, but amendment to make the statute as little objectionable as possible was made and if those who will probably be affected will only possess their souls in patience, an interpretation will be made at a time when it will not be necessary for Mr. Wickersham to have so much regard for the campaign manager and his office.

Mr. Emery today called attention to the fact that the 48-hour per week with a Saturday half-holiday amendment offered in the senate by Mr. Lodge did not prevail, although copies of the bill were published containing that amendment, marked "as passed by the senate." That was an error in the government printing office which will not appear in the statute when published.

Killed in Automobile Accident

W. F. Billenstein, president and general manager of the National Iron & Wire Co., 3901 Hamilton avenue, Cleveland, died July 8, as a result of injuries sustained when a freight train hit an automobile in which he and his family were riding. He was 50 years old and had always lived in Cleveland. About 30 years ago, Mr. Billenstein, and a number of friends, organized the National Iron & Wire Co., a fabricating and erecting concern, and he had always acted as a director of the company.

Mr. Billenstein was a member of the Builders' Exchange, of Cleveland, and was a member of the executive committee. He was actively interested in the Cleveland Manufacturers' Club, of which he was one of the founders and a member of the board of trustees. Both organizations paid high tribute to him at special meetings Tuesday.

One other member of the family, Miss Cora Billenstein, 18, died the day following the accident, and chances are said to be against the recovery of Mr. Billenstein's widow, who received a concussion of the skull and severe bruises. Others who were injured in the accident are considered out of danger.

Employes Have Trouble

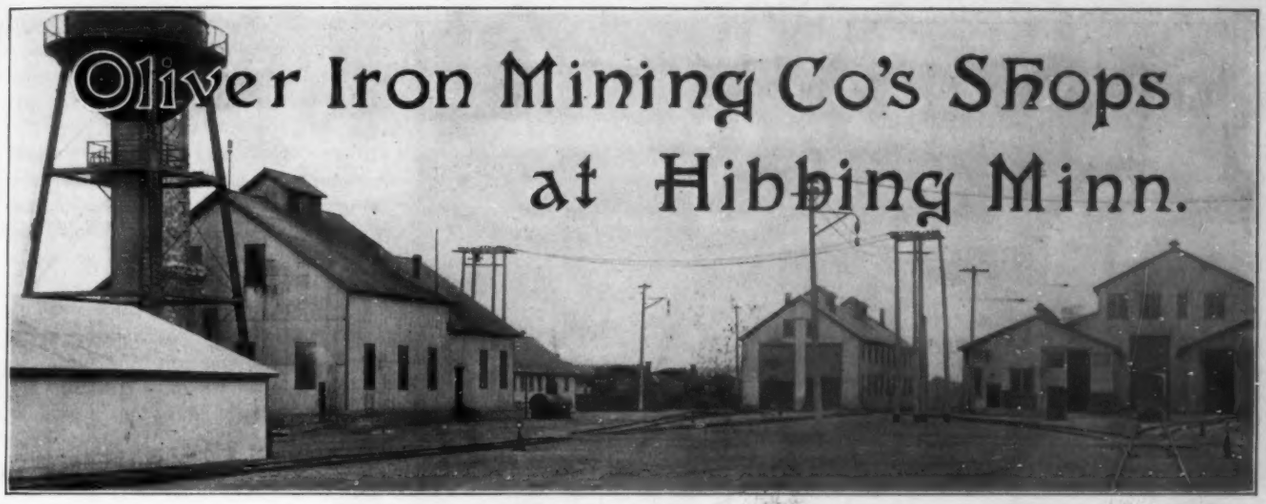
Pittsburgh, July 10. (By wire.)—Trouble between roll hands and helpers at the Girard mill of the A. M. Byers Co. forced a suspension this week, the helpers demanding more money. The company has nothing to do directly with the trouble, but is trying to hasten an adjustment.

BLAMED ON BROKERS

Who Sold Short, Is Agitation About Alleged Coke Pool.

The coke operators in the Connellsville region during the past week were somewhat interested by reports circulated anonymously of complaints being filed with the department of justice in Washington against an alleged pooling of the producers of furnace coke to maintain or advance prices. The reports caused some surprise and were promptly denied by the leading operators, who declared that they knew nothing of any such pool. They declared that there had not been any secret agreements or meetings held or any effort to disregard the laws, which the trade thoroughly understands. The report indicated that a former agent of the department of justice had begun the investigation, and had forwarded to Washington very sensational evidence of meetings being held. The active spirit of this investigation was given as G. K. Moore, who was at one time a government agent. The effort to secure some action by the government to break the present coke price is blamed by the operators on the failure of brokers in coke, who sold "short" on last half contracts, to obtain any tonnage at prices which would enable them to fill their speculative orders. The operators deny that furnaces or large buyers are concerned in the movement, although it is regarded as quite likely that some furnace concerns would welcome any effort to break through the present strong position of the coke men, and enable them to get their fuel at less than $2.50 per ton at the ovens for the last half. The matter is regarded as one of the evidences of the severe strain that the coke market has been passing through, consumers of furnace coke resisting with all their power the equally determined attitude of coke men to get the average price of $2.50 for standard Connellsville furnace coke for last half requirements. It is estimated that from 150,000 to 200,000 tons per month contracts usually placed before July 1 have been held up because of the new high price demanded by the coke men, and in some instances furnaces are believed to have remained banked since July 4 awaiting a more definite outcome of the struggle before attempting to make iron on the higher cost that the new price would entail.

The coke operators, who are chiefly concerned in the alleged complaint, state that they are perfectly willing to allow legitimate investigation.



Oliver Iron Mining Co's Shops at Hibbing Minn.

Safeguarding Equipment to Prevent Accidents

A couple of years ago the growth of the open pits around Hibbing, Minn., had so changed the topography of the country that the Oliver Iron Mining Co. found it necessary to make some extensive alterations in its arrangements for handling ore in this district. Among other undertakings it was decided to connect the Sellers pit on the east side of the town with the Hull-Rust mine on the west, digging a deep cut across the north edge of the city. This would also make a large tonnage of hitherto unmined ore available. The territory traversed by the new cut was at that time occupied by residences and also by the district headquarters of the Oliver Iron Mining Co. It became necessary to move the latter to a new and permanent location and a site was selected at the southwest corner of the town, near the southern approach to the Hull-Rust pit.

At this point new shops, warehouses, offices and laboratories have been built and the new headquarters embody some of the latest ideas in the design

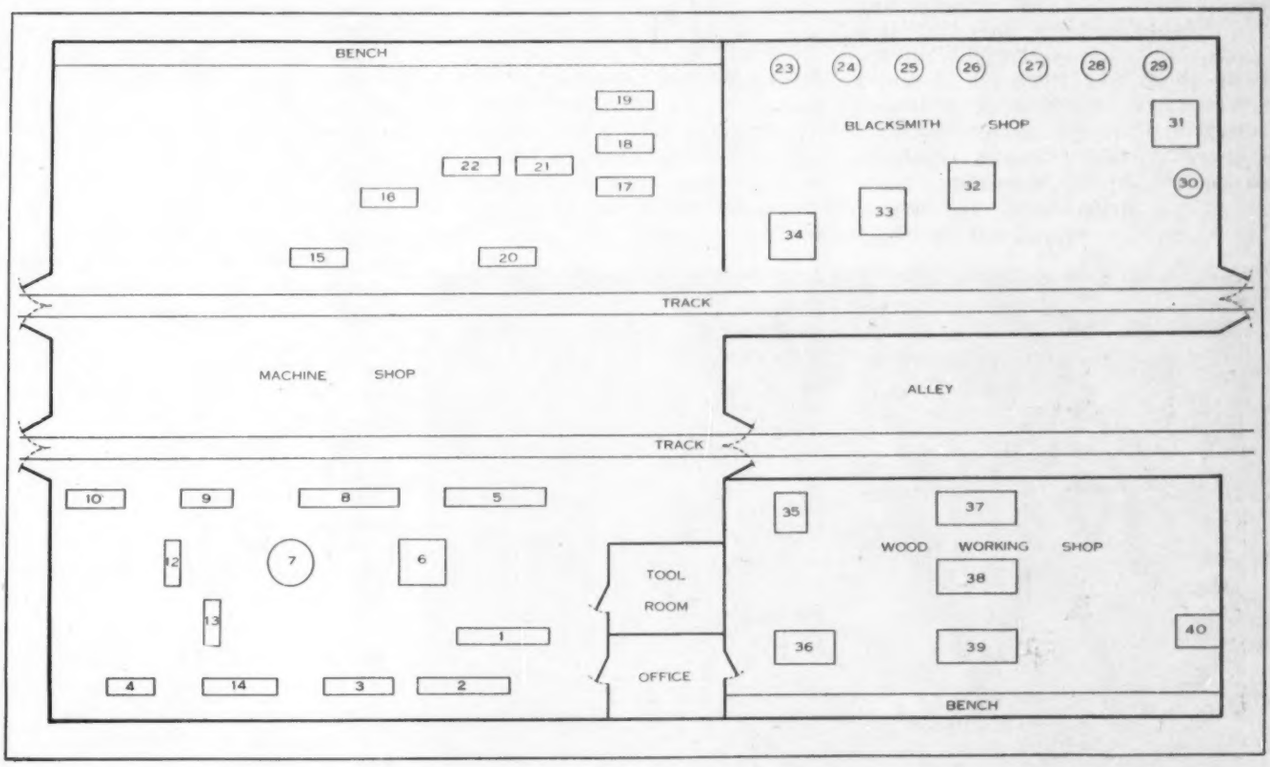


FIG. 1—PLAN, SHOWING THE ARRANGEMENT OF TOOLS IN THE HIBBING SHOPS OF THE OLIVER IRON MINING CO.

1—27-inch engine lathe; 2—22-inch engine lathe; 3—18-inch engine lathe; 4—18-inch engine lathe; 5—48-inch planer; 6—28-inch Cincinnati shaper; 7—60-inch Niles radial drill; 8—60-inch drive wheel lathe; 9—vertical boring mill; 10—hydraulic 300-ton wheel press; 11—30-inch planer; 12—grindstone; 13—power hack saw; 14—emery wheel; 15—14-inch pipe cutter; 16—3-inch pipe cutter; 17—24-inch upright drill; 18—3-inch bolt cutter; 19—3-inch bolt cutter; 20—48-inch radial drill; 21—surface grinder; 22—emery wheel; 23 to 30—forges; 31—punch and shear; 32—2,000-pound steam hammer; 33—1,000-pound steam hammer; 34—Hartz flue welder; 35—blade sharpening emery wheel; 36—band saw; 37—rip saw; 38—planer; 39—joiner; 40—cut-off saw.

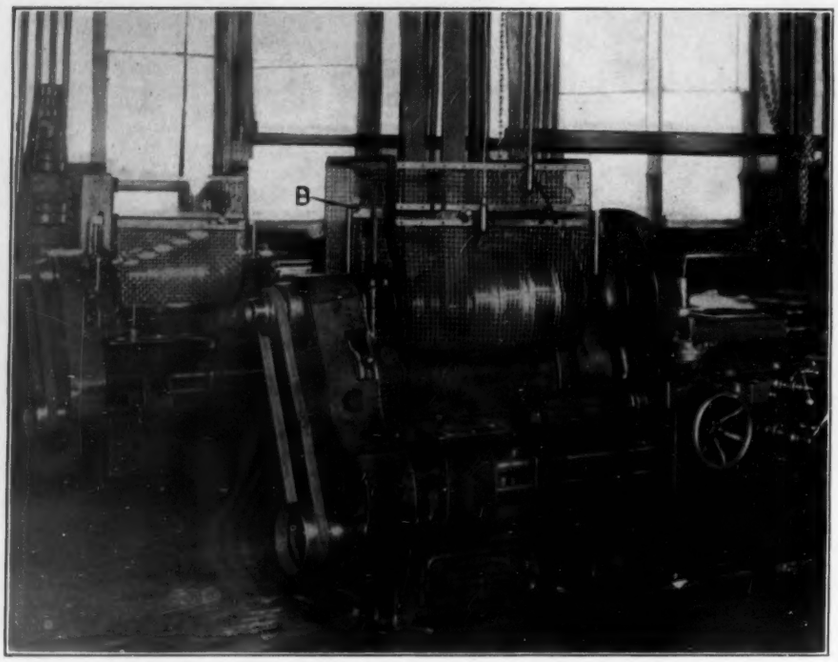


FIG. 2—ENGINE LATHE WITH BELT SHIFTER AND SELF-LOCKING STARTING DEVICE

and layout of plants of this character. In equipping the new shops the question of safety appliances was given a great deal of consideration and an unusually large number of devices for the prevention of accidents have been installed. In fact, the unusual attention which has been given to safety appliances is perhaps the principal feature of the new Hibbing headquarters. The work in this direction at Hibbing simply follows the general policy of the Oliver Iron Mining Co., and the United States Steel Corporation in devoting special attention to the prevention of accidents. Because of the large number of safety devices which have been installed, the Hibbing shops are among the most unusual in the country, although their general tool equipment and arrangement are standard in every respect.

Layout of Headquarters

The general arrangement of the new headquarters is illustrated in Fig. 15. As laid out at present the buildings occupy a tract of ground at the corner of Sellers street and First avenue, approximately 1,200 feet in length and 700 feet in width. The office, laboratory and buildings auxiliary to the latter, occupy the northeast corner of the site, while the south half of the tract is devoted to shop purposes. The principal building, as shown in Fig. 15, is 210 feet long and 115 feet wide. It contains the machine shop, blacksmith shop and carpenter shop. The foundry, fuel shed, storage sheds and warehouse are situated in a row on the north side of the machine shop, while the locomotive, dry, power house, carriage shed and barn are similarly arranged on the south side. The various shops are served by a number of standard gage railroad tracks. The shop buildings have steel frames with galvanized sheet steel sides and are strictly fireproof. In order to further reduce the fire hazard, great care is taken to keep the yard in a clean and orderly condition.

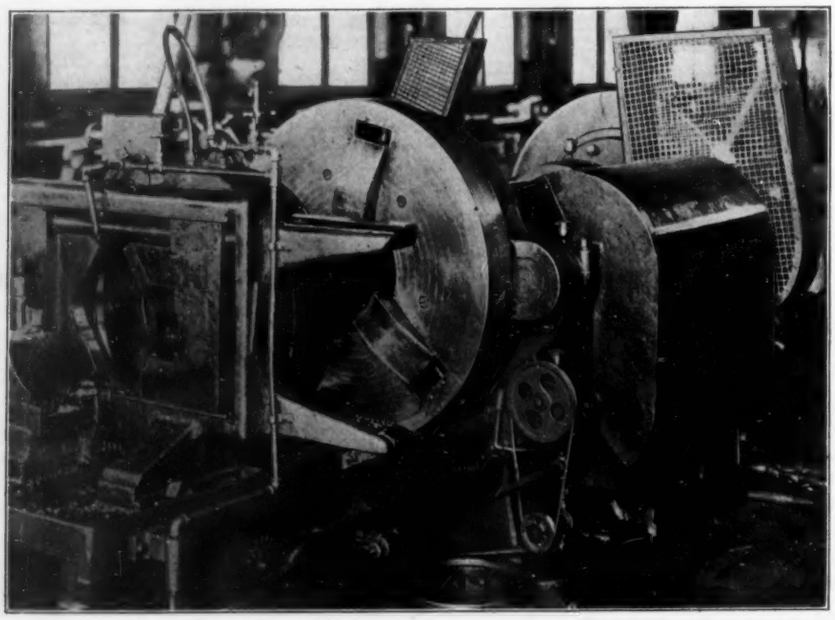


FIG. 3—GUARDED PIPE CUTTER PROVIDED WITH SAFETY STARTING DEVICES

Arrangement of Tools

The general arrangement of the tools in the machine shop, forge shop and carpenter shop, is illustrated in Fig. 1. These shops are devoted almost exclusively to locomotive and steam shovel repair work and are, therefore, similar in their general equipment to the larger railroad shops located throughout the country. In the machine shop, which is approximately 115 feet square, the four engine lathes, ranging from 18 to 27 inches swing, are placed along the south wall. The heavy boring, planing and shaping tools are grouped just south of the center track which extends through the building. These include a 28-inch shaper, 60-inch radial drill, 60-inch drive wheel lathe, vertical boring mill, 30-inch planer, 300-ton hydraulic wheel press, etc. Locomotives undergoing repairs are brought into the shop on the center track. The light machine tools occupy the north aisle, as shown in Fig. 1; these include 3-inch and 14-inch pipe cutters, small drill presses, surface grinder, emery wheels, etc. The blacksmith shop contains eight forges, a 12-inch punch and shear and two steam hammers rated at 1,000 and 2,000 pounds, respectively. A Hartz flue welding machine is also included in the forge shop equipment. The carpenter shop contains the usual woodworking tools, including a band saw, rip saw, planer, joiner, cut-off saw, etc.

Safety Devices

In installing the safety devices at the Hibbing shops attention was first directed toward belt shifting apparatus and guards for the head stocks and gears of lathes. Fig. 2 shows a 22-inch Le Blond engine lathe, completely equipped with guards and mechanical

belt shifting apparatus. A stout wire guard is placed entirely around the cone pulley and a strong, sheet iron casing, *C*, completely covers the gears. These cases and guards are so arranged that they can be opened easily for oiling or inspection, but this is not permitted when the machinery is in motion. On all tools, the wire guards around the belts are built to a height of 5½ feet from the floor.

The belt shifting apparatus is shown clearly in Fig. 2. The handle, *H*, is attached to a wrought iron guard which completely surrounds the belt and slides horizontally on the bar, *B*. A similar sliding arrangement is placed at the upper cone pulley and is operated by the suspended cords, *A*. The belt shifting is entirely mechanical and there is no danger of a man getting his fingers pinched between the belt and the pulley in changing from one speed to another. Also, with this device, the belts can be shifted much more rapidly and with less exertion than by hand. Accidents frequently occur by the belt, from the main shaft to the countershaft, creeping from the loose pulley to the tight pulley, thus starting the machine without warning. To prevent this, the tools in the Hibbing shops are equipped with starting levers provided with locking devices which absolutely prevent the belt from creeping. The locking device is attached to a pair of steel fingers which hold the belt in any position the fingers may be placed. On some tools the locking device, to prevent the machinery from starting accidentally, is made in the form of a lever sliding on a quadrant, as shown at *L*, Fig. 8.

Safeguards on Pipe Cutters

Figs. 3 and 4 show the safety devices on 14-inch and 3-inch pipe cutters, respectively. As indicated in Fig. 3, the gears on the large pipe cutter are completely covered by a heavy sheet steel guard, while the belt and driving pulley is surrounded by a wire mesh guard extending to the standard height above the floor. These tools are also equipped with locking devices, communicating with the clutch to prevent accidental starting. The construction of the wire belt and pulley guard is shown clearly in Fig. 4. The frame consists of steel angles to which the wire mesh is securely riveted.

Fig. 5 indicates how carefully the flue welding machine in the forge shop has been guarded in order to prevent accidents. A strong wire screen has been placed entirely around the machine, leaving only a small opening for the insertion of the flue. This machine contains a large revolving head,

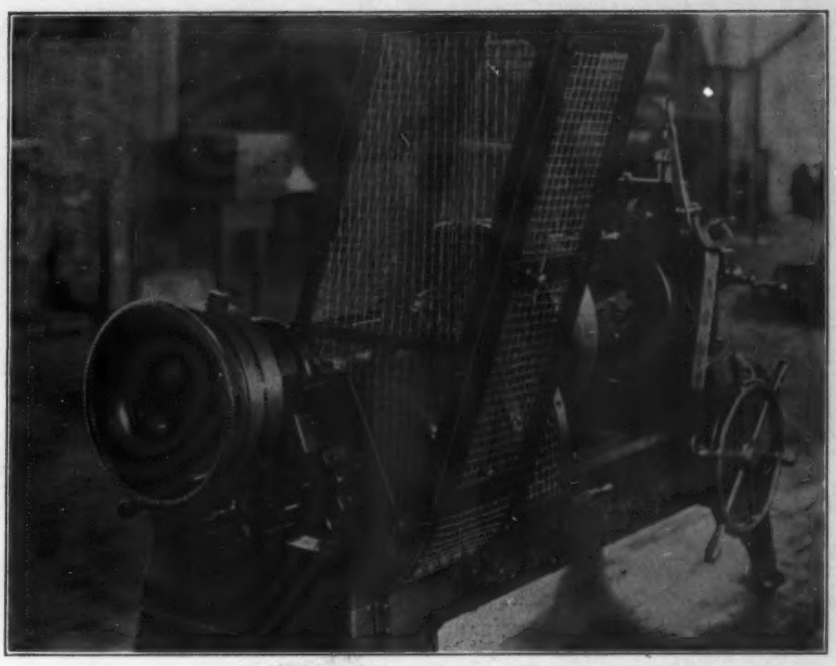


FIG. 4—PIPE CUTTER WITH SPECIAL GUARD OVER BELT

having many projecting parts, together with an exposed gear, making it unusually dangerous. It was, therefore, decided to enclose the entire machine with a guard in order to prevent any possibility of injury.

A Safeguarded Surface Grinder

A surface grinder is usually a hazardous machine to operate and should not be handled by anyone but an experienced workman. To insure this, the surface grinder at the Hibbing shops is kept under lock and key and can be operated only by properly authorized persons. The ordinary emery wheels are all fitted with safety collars, that is, the wheel is convex and the collars concave so that in case it should break, the fragments would be held in place. In addition, to protect the eyes of the workmen from flying particles, a heavy glass shield is placed just above the work rest. It is found that the particles from the wheel strike this shield with sufficient force to grind the surface of the glass in the course of time, making it opaque. If the wheel were not fitted with this guard, it is clearly evident that the same particles would strike the faces of the workmen with practically equal velocity. The glass shields are renewed about once a

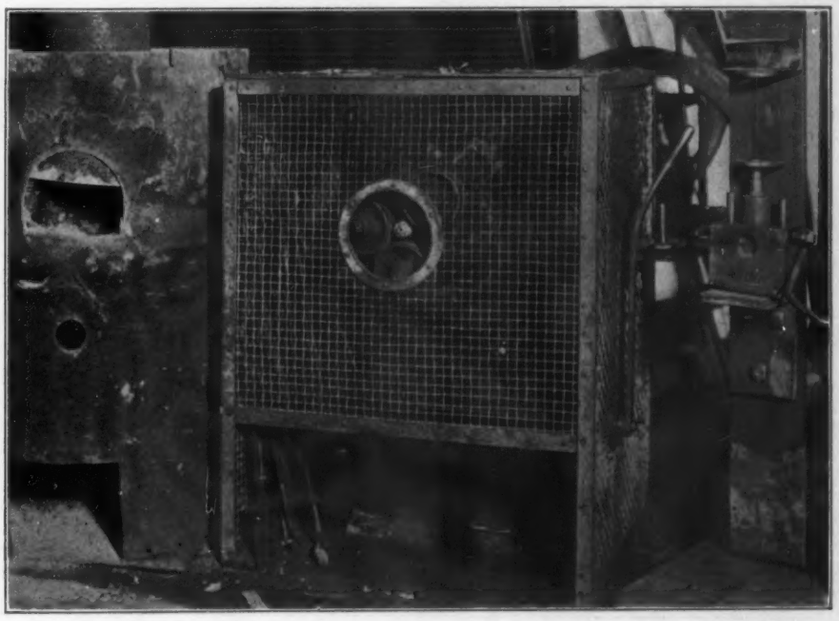


FIG. 5—FLUE WELDING MACHINE COMPLETELY ENCLOSED BY WIRE GUARD

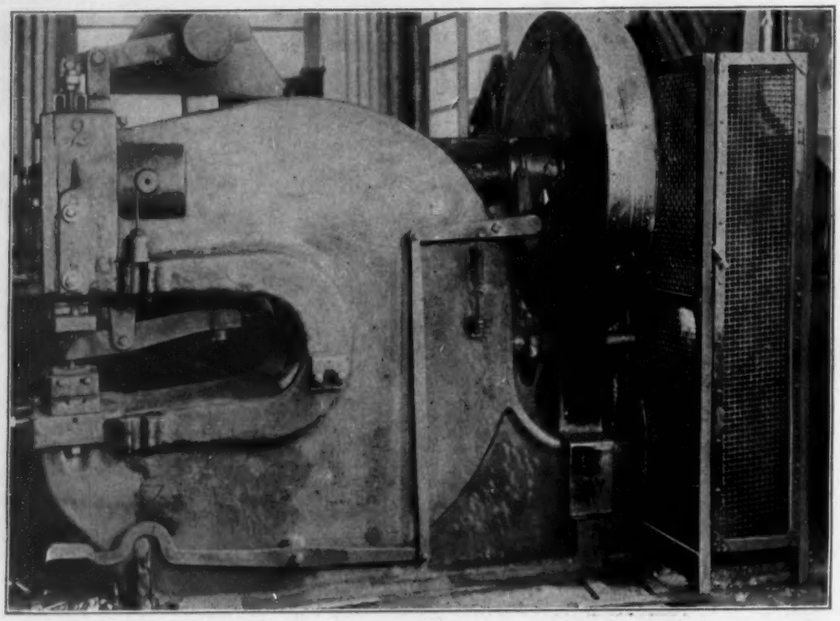


FIG. 6—PUNCH AND SHEAR WITH MOVING PARTS PROTECTED

month. In addition to having safety collars, the emery wheels are completely enclosed, except on the working face, with a strong sheet steel guard and as an additional protection, a steel strip 4 inches wide and 1 inch thick is bent around the wheel and fastened to the inside of the guard. Should a piece break from the wheel this heavy strip would prevent its being projected out into the room. Fig. 6 shows the various safety appliances placed on the punch and shear located in the blacksmith shop. The heavy spur gear drive of this machine is completely enclosed. No satisfactory method of guarding the dies of the punch has been discovered.

A man operating woodworking tools is fully as liable to receive serious injuries, if not more so, than one engaged in a machine shop. The Oliver Iron Mining Co., therefore, has given special attention to the installation of safety devices in its carpenter shops. One of the most dangerous machines in a woodworking shop is the joiner, the knives of which are exposed and revolve at very high speed. Fig. 7 shows how this machine is protected, using a patent guard manufactured by the Jones Safety Appliance Co., Buffalo. This guard is controlled by a spring which keeps it constantly over the exposed knives of the machine. When the machine is being used the guard is temporarily pushed side but immediately comes back into position as soon as the work has passed over the knives.

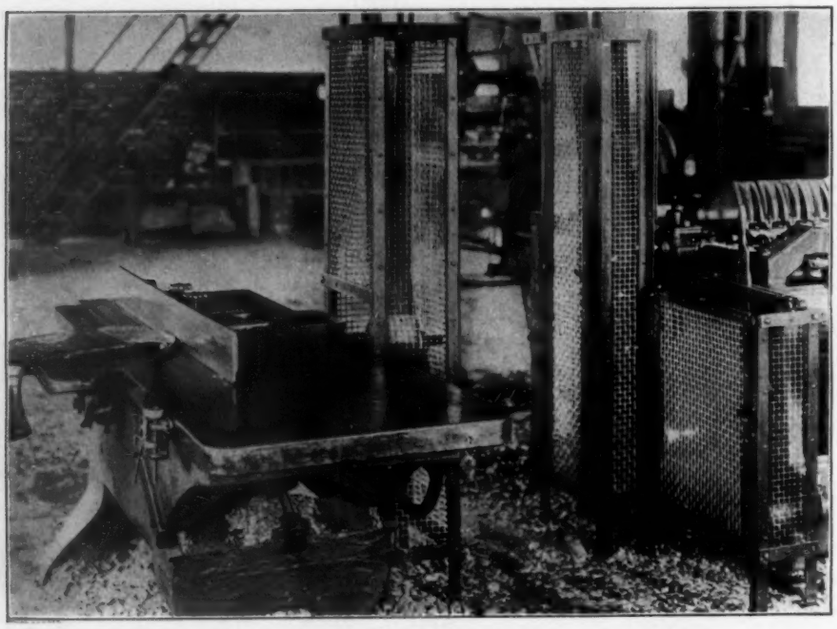


FIG. 7—JOINER WITH SPECIAL SAFETY GUARD

Fig. 8 shows another view of the guards on the joiner and also those on the planer, which is equipped with a safety head. The elaborate wire guards around the belts and pulleys are shown in an unusually clear manner in this illustration. These machines are controlled by clutches placed on the countershaft. The clutches are actuated by the levers, *L*, Fig. 8, which are equipped with positive locking devices that absolutely prevent the machines from being started accidentally.

Safeguarding Circular Saws

A number of devices have been installed for safeguarding circular saws, two of which are illustrated in Figs. 9 and 11. These devices are similar in principle, but the one shown in Fig. 9 is generally considered more satisfactory because it is provided with idlers which guide the work under the guard. Each guard consists of a sheet steel shell which completely encloses the saw. This shell moves vertically and is counterbalanced. Care should be taken not to have the counterbalance weight too heavy, otherwise the shell will remain in the air, leaving the saw exposed, thus failing in its purpose. A guard for band saws is shown in Fig. 12. The lower wheel is completely encased in a sheet steel cabinet, while the upper one is guarded by a heavy reinforced wire net. The starting handle is shown at *S*. In many shops the band saw is so installed that the starting handle is not accessible from the working side of the saw table. Instead, it is necessary to first start the machine and then walk around it before any work is done; after the piece is sawed it is again necessary to walk around the saw to stop the machine. This, of course, increases the liability of accidents. The starting handle, shown in Fig. 12, is equipped with a locking device which prevents the belt from shifting unexpectedly from the loose to the tight pulley. At the Hibbing shops metal sleeves are provided to prevent the clothing of workmen from catching in moving drills or drill chucks. These sleeves are pieces of pipe or tubing which fit over the drill and they are of sufficient length to permit the tool to enter the work to the proper depth.

Protected Switchboard

All engines, boilers and similar apparatus at the Hibbing headquarters are thoroughly protected with safety devices. Fig. 10 shows the heavy screen around the switchboard in the power plant; this prevents accidental contact

with the charged portions of the board. This guard also carries a danger sign which is so printed that it can be understood by almost any nationality.

The line and counter shafts in all of the shops are easily accessible by permanent gangways which are so arranged that the oiler or inspector cannot accidentally come in contact with moving parts. Severe accidents often occur through set screws catching the clothing of workmen; in order to prevent this, safety set screws are used throughout the Hibbing shops.

Safety devices alone will not prevent accidents. On the contrary, the workmen must be so disciplined that they will constantly exercise sufficient care in their own behalf. This phase of the safety problem has been very clearly discussed by Alexander M. Gow, assistant chief engineer of the Oliver Iron Mining Co., in a recent paper on safety appliances, in which he says:

"Too much emphasis cannot be placed upon the necessity for constantly inculcating care and caution. A few months ago the writer visited a mine where every part of the equipment was of the 'hay wire' type, and the condition of the machinery positively dangerous and threatening. The writer was accompanied by the superintendent of a mine where every possible device and method are used to avoid accident. The superintendent remarked that despite the absolute disregard of safety precautions, the accidents reported from that mine were not excessive. This apparently is poor encouragement for the advocates for safety measures. But it is undoubtedly a fact that every man around that mine was careful and cautious because he was constantly impressed by the general hazardous condition of things. But no one would argue for a moment that fear furthers efficiency—and that care and caution should be made compulsory by such means. If that same amount of care and caution can be made a working factor along with mechanical safeguards and the observance of safety rules, the hazard can be reduced to a minimum.

Investigations of Accidents

"To make the safety movement really systematic, one of the first requirements is that every accident be immediately reported and then honestly investigated. This investigation, in many cases, can be done by a safety committee from among the men themselves. The object is not so much to find out who is to blame as how to prevent the repetition of the accident. Not only serious accidents should be reported, but all accidents, even though at the time apparently trivial. This systematic reporting of all accidents will apparently increase the number of accidents, for many trivial accidents will be reported which will go to swell the total number. Consequently, to find out whether or not the safety movement is really efficacious, it is necessary to have a 'follow-up' plan that shall keep careful record of the time lost. If the loss of time due to accidents is reduced, good results are being accomplished whether or not there is an apparent increase in the number of accidents. Consequently, the systematic classification of accidents and the record of each individual case becomes an important part of the safety movement.

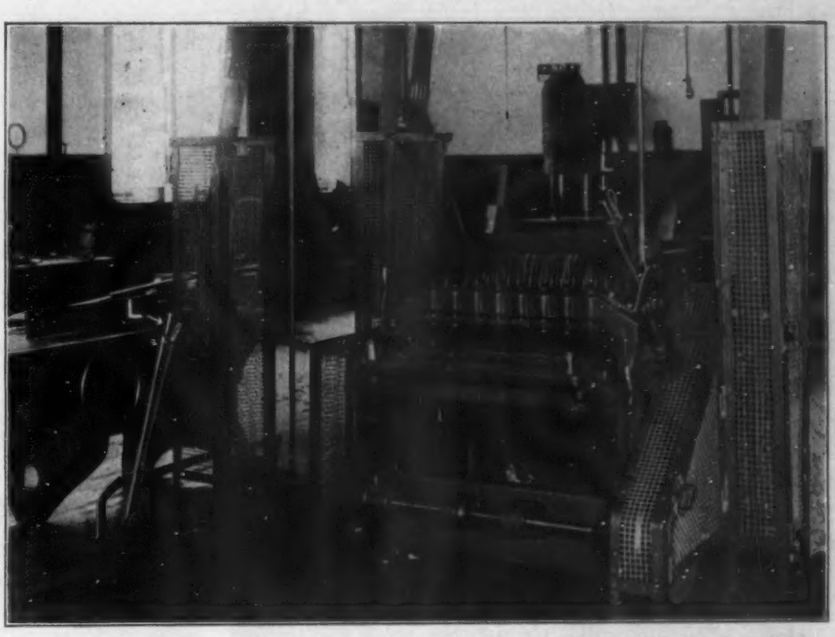


FIG. 8—JOINER AND PLANER WITH SELF-LOCKING STARTING DEVICES

"Despite the heavy expenditure for mechanical safeguards, only about 30 per cent of the employes are affected by them. To illustrate: The guards around a hoisting engine afford no protection to the men timbering a drift. Most of the work in mining is of such nature that it cannot be rendered less hazardous by the use of mechanical appliances. This does not detract from the value of mechanical appliances, but only emphasizes the fact that in addition to the mechanical appliances, there must be influences brought to bear directly upon the men that will tend to promote care, caution and a constant regard for their fellow workmen; and these influences are education and agitation. For everyone knows,

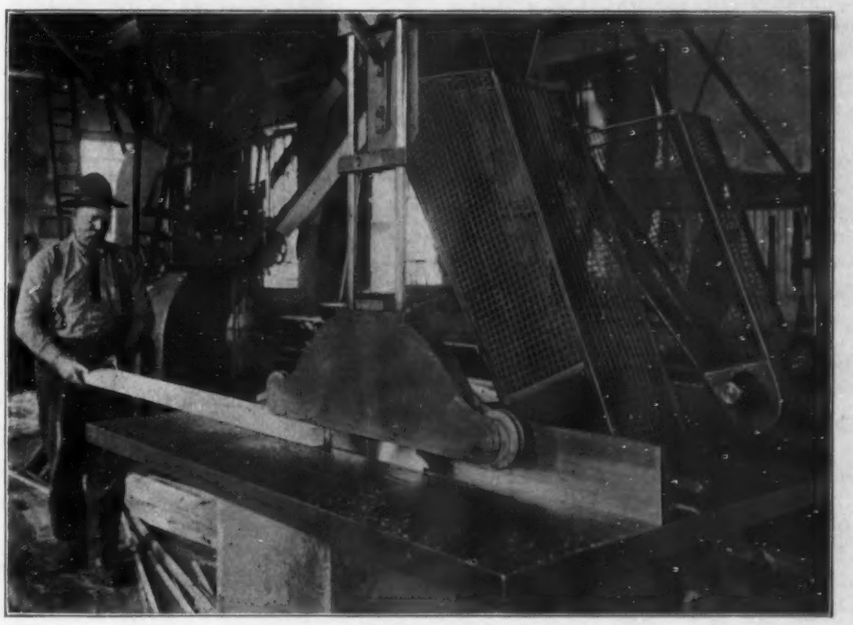


FIG. 9—COUNTERWEIGHTED CIRCULAR SAW GUARD

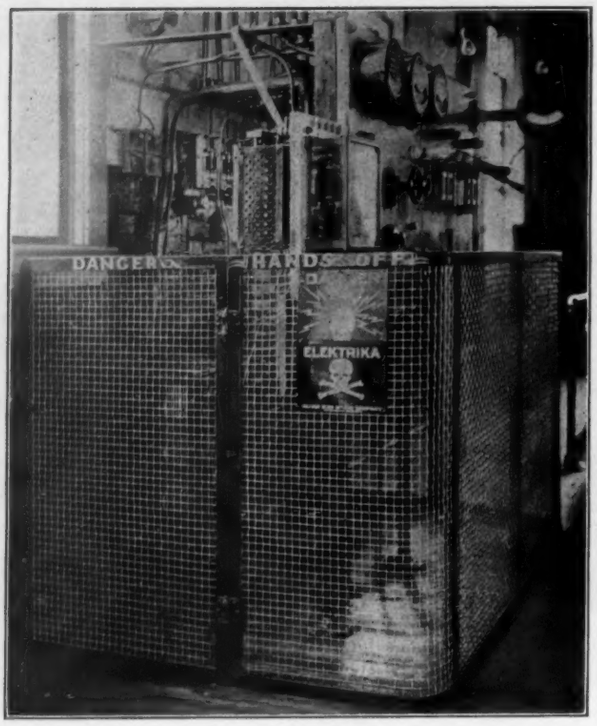


FIG. 10—SCREEN FOR PROTECTING SWITCHBOARD

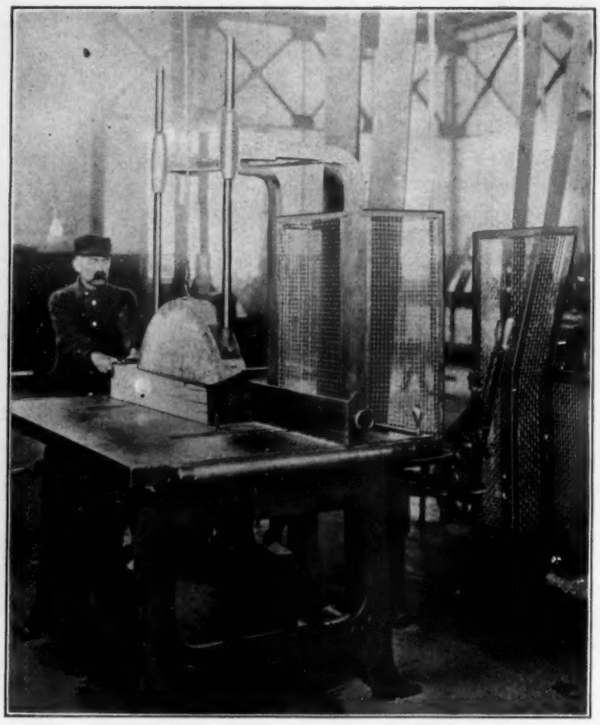


FIG. 11—ANOTHER FORM OF CIRCULAR SAW GUARD

who has investigated the subject, that carelessness, indifference and ignorance cause a majority of industrial accidents. Investigation of a serious accident will almost invariably show that somebody took a chance, used poor judgment, or was guilty of carelessnes bordering on criminal.

Inspection of Equipment

"Among the first steps taken by the Oliver Iron Mining Co. was a general inspection of surface equipment. Hundreds of recommendations were made, practically all of which were immediately followed. These first recommendations had to do mainly with the safeguarding of machinery; the placing of hand-rails and toe-boards on overhead platforms; the installation of stairways in place of ladders, and the use of mechanical safety devices. Approximately $150,000 was spent upon this work; it being understood that when a safeguard, such as a hand-rail, a stairway or a shield over a gear, was ordered, that it should be so designed and so installed as to be permanent. No makeshifts or poor excuses were tolerated. As a result, the work will not have to be done over.

"The many suggestions and recommendations, taken along with all the information and ideas that could be gathered from other companies, have led, finally, to the formulation of a large number of safety rules and regulations covering all the various operations. It is part of the business of every superintendent and under him, every master mechanic, and shift boss, to be familiar with these rules, and so far as possible, to see to it that the men are also familiar with such as apply to the work they are engaged upon. But, mere familiarity with rules will not make for safety. The rules must be obeyed. And to this end, systematic inspection is going on all the time and systematic agitation among the men, who are incited to *boost for safety.*

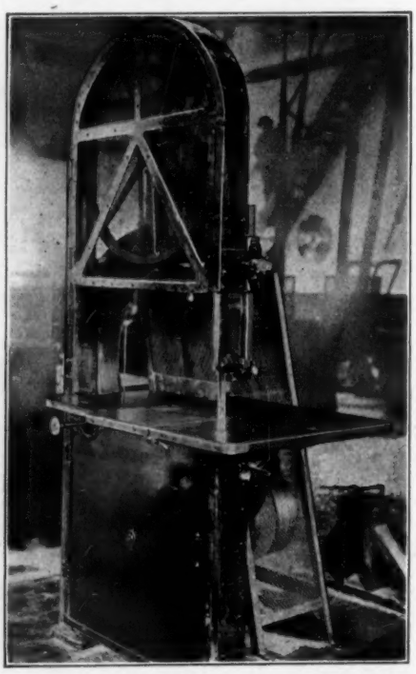


FIG. 12—BAND SAW, WITH METAL GUARDS

To insure that this safety movement shall not be merely spasmodic and to secure the proper maintenance of all equipment in safe condition, inspectors are employed at all the shops. In addition, two men who were formerly mine superintendents, do nothing but inspect the various properties of the Oliver Iron Mining Co., making monthly reports to the general manager. These men are on the go constantly from one mine to another and have no duties other than those directly concerned with the safety and welfare of the employes."

Safety Appliances For Boilers

The power plant at Hibbing headquarters includes an E. P. Allis simple, non-condensing, Corliss engine, belted to a Westinghouse, 100-kilowatt, 250-volt, 3-phase, 600-r. p. m. alternator, provided with a 125-volt, 30-ampere, 32-kilowatt, direct-connected exciter. This unit supplies practically all the electricity which is used for power throughout the shops. An Ingersoll compound air compressor is also installed and a new Erie engine, direct-connected to a 75-kilowatt, Westinghouse generator will soon be added to the equipment. Steam is furnished by three return tubular hand-fired boilers, equipped with rocker grates. The boilers carry 115 pounds steam pressure. Considerable money has been spent in fitting the boilers with safety appliances. Permanent ladderways and platforms make everything available, and all of the steam piping

P. 848. 10M. 4-10. LeT.

Oliver Iron Mining Company.

.....MINE.

To..... .....191...
Foreman.

Give employment to.....

.....
FOREMAN. MINING CAPTAIN.

Signature of employee}.....
Began work.....
Occupation..... *Mine No.*.....
Residence.....
Nationality.....
Married or Single.....

.....
FOREMAN. SHIFT BOSS.

FIG. 13—EMPLOYMENT SLIP

P. 843. 20M. 9-11. LeT.

Oliver Iron Mining Co.

SETTLEMENT ORDER

.....*Mine.* .....191...

To.....

Please settle with

.....*Mine No.*.....
Employee.

Reason for leaving.....

Time worked today.....*hours.*

.....
FOREMAN.

PRESENT AT OFFICE.

FIG. 14—EMPLOYES' DISCHARGE SETTLEMENT ORDER

immediately and easily accessible. It is, therefore, possible to shut off the stop valves almost instantly in case of necessity. The water glasses are protected by a supplementary wire glass tube about 1½ inches in diameter, which fits over the ordinary gage glass. The former is over ⅛-inch thick and will not break even under the most severe conditions. The guards on the water gages have prevented many serious burns.

As shown in Fig. 15, a shop for making temporary locomotive repairs is situated just south of the machine shop. It is provided with compressed air drop pits for taking out driving wheels. After the wheels have been dropped into the pit they are transferred on a truck to a point where they may be reached by the crane.

Since no manufacturing is done at Hibbing headquarters, the work in the shops is necessarily somewhat irregular in character and calls for considerable mechanical ingenuity and skill in its execution. In accordance with the usual practice adopted by railroads, each locomotive and steam shovel is charged with the cost of its own repairs. The workmen in the shops are provided with time slips which they fill out and file each day. These show the time spent on the various jobs in order that the labor may be properly charged. The material is drawn from the store house and charged to the particular job for which it is required.

Two rather interesting forms, Figs. 13 and 14, are used in hiring and discharging labor. New men are required to sign the form shown in Fig. 13 and when this is properly approved it is the timekeeper's authority for placing the man's name on the payroll. The upper half of the form is a note or order directed to the foreman or gang boss and signed by the general foreman, authorizing the former to give employment to the man named on the slip. The lower half of the card contains space for the signature of the employe, his occupation, residence, nationality, etc. When a man leaves the employment of the company for any reason, the form shown in Fig. 14 is filled out. This is signed by the foreman and when presented at the office insures an immediate settlement of any wages which may be due.

American Production of Manganese Ores

The production of manganese ores in 1911, according to E. F. Burchard, of the United States geological survey, was 2,457 long tons, valued at $24,586, a slight increase over the figures for 1910. The ore was mined in the states of California and Virginia.

The importation of manganese ores continues to greatly exceed the domestic production, and will probably continue to do so as long as the principal sources of foreign supply are abundant and cheaply worked, and ocean freights are low. In 1911 the imports were 176,852 long tons, valued at $1,186,791, a decrease of 65,496 tons as compared with the importations for 1910. This decrease in the demand for manganese is attributed to the depression in the iron and steel industry.

The statistics of production and imports of manganese ores, and a discussion of the foreign and domestic sources of manganese, are contained in an advance chapter by Mr. Burchard from Mineral Resources for 1911, now being printed.

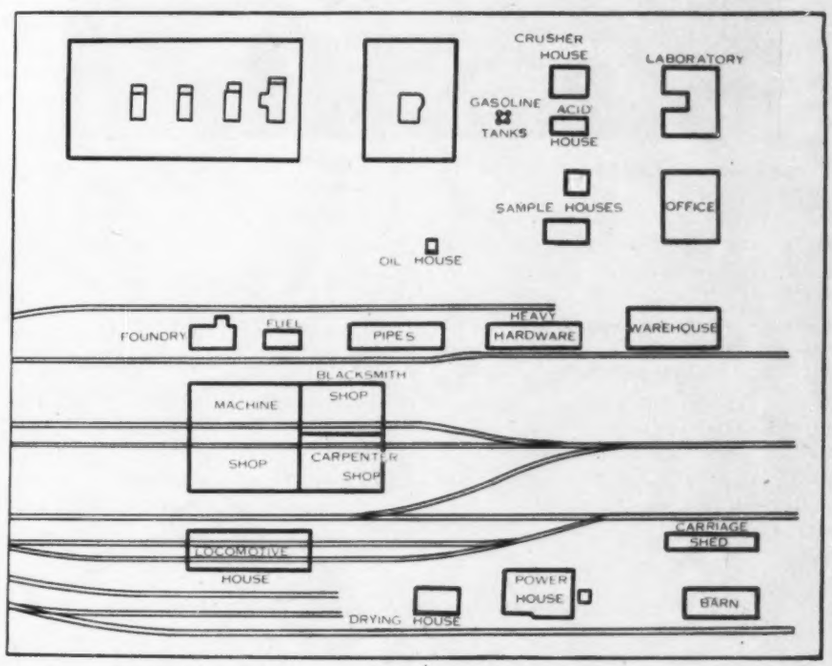
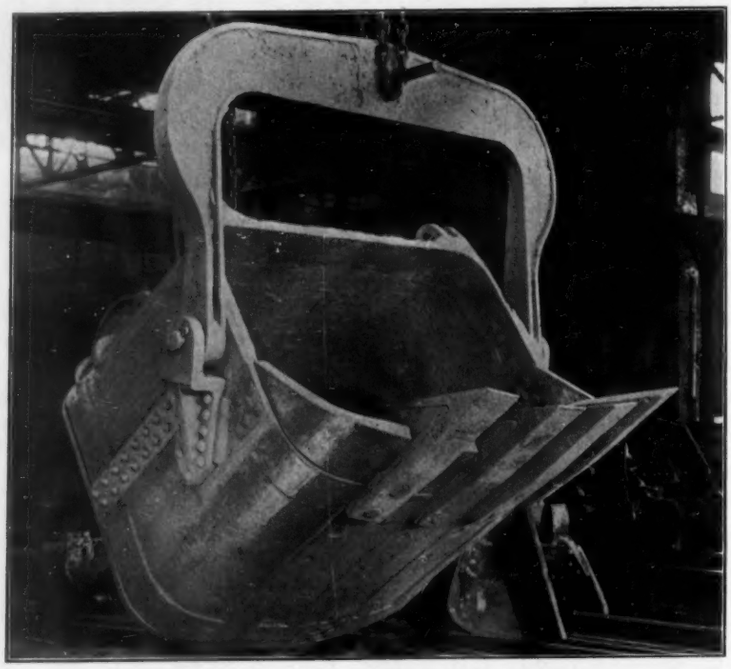


FIG. 15—GENERAL ARRANGEMENT OF HIBBING HEADQUARTERS OF THE OLIVER IRON MINING CO.

New Steam Shovel Dipper

About a year ago the Edgar Allen American Manganese Steel Co., Chicago, shipped three steam shovel dippers of new design to the Panama canal. It is understood they have successfully withstood the unusually severe service encountered in the canal work and the builders have, therefore, arranged to market them in this country. They are especially suitable for iron mining and some are already in service on the Mesabi range. Every part of the dipper, including the back, is of cast manganese steel. The dipper body consists of only two castings, the front and back halves. The bail brackets are set at an angle conforming to the line of pull on the bail and by putting them against projecting shoulders cast on the sides of the front half of the dipper, the shearing strain is relieved from the bail bracket rivets.



FIVE-YARD, CAST STEEL SHOVEL DIPPER

The joint between the front and back castings is behind the bail bracket so that the digging strain does not tend to pull the dipper apart. The teeth are riveted in position, but are held rigidly also by means of notches in the lip and shelf and by off-sets on the outside of the lip. The dipper is so designed that renewable runners or shoes and a renewable bottom can be used, or these parts may be cast integral with the dipper front.

All pin holes in the bails, hinge brackets and dipper stick brakets are provided with renewable bushings. These dippers are built in all sizes for the various makes of steam shovels and dipper dredges, some of the largest having a capacity of five cubic yards each.

Congress of Applied Chemistry

The Eighth International Congress of Applied Chemistry will be held in Washington and New York City from Sept. 4 to 13. Approximately 700 papers have been promised for the congress. The fall meeting of the American Electro-chemical Society will be held in connection with the congress, the joint meeting having been scheduled for Sept. 7, 9 and 10. On Sept. 7 the American Electro-chemical Society will meet jointly with the American Institute of Mining Engineers and the congress section 111A on metallurgy, the topic for discussion being "Electro-metallurgy."

Spanish Iron Ore Output

The Spanish production of iron ore for the year 1910 amounted to 8,650,000 tons, which slightly exceeded the output of the previous year, although it was considerably below the record-breaking output of 1907. The output of other minerals included 294,000 tons of pyrites; 8,600 tons of manganese ore, 3,231,000 tons of copper ore, 156,000 tons of zinc ore, 35 tons of tin ore and 216,700 tons of lead ore. These figures represent an increase over the output of the previous year in all minerals except zinc and tin, the decrease in the output of the former being 7,000 tons, and 1,465 tons in the latter. The pig iron production for the year 1910 was lower than in any year since 1902, and only amounted to 373,000 tons. The production of rolled iron, wrought iron and forgings was 58,100 tons; rolled steel, 171,600 tons; steel forgings and castings, 11,200 tons. Other manufactures of iron and steel amounted to 16,400 tons.

Iron and Steel Production of South Russia

According to recently available figures relating to the iron and steel production of South Russia in 1911, the output of pig iron increased 355,000 tons, having totaled 2,376,000 tons against 2,031,000 tons in 1910. The pig iron output consisted of 519,000 tons of foundry, an increase of 118,000 tons; 1,788,000 tons of basic and Bessemer pig, an increase of 215,000 tons and 69,000 tons of miscellaneous grades, an increase of 12,000 tons. Of steel ingots there were produced 2,096,000 tons, an increase of 249,000 tons, divided as follows: Open-hearth steel, 123,000 tons; acid Bessemer, 106,000 tons; basic Bessemer, 20,000 tons. The production of finished material showed an increase of 226,000 tons, having attained a total of 1,815,000 tons, against 1,589,000 tons in 1910. The increase affected all classes of finished materials except sheets and standard rails, and these two lines decreased 4,000 and 34,000 tons, respectively. Other classes of finished materials showed gains as follows: Beams, 64,000 tons; merchant bars, 71,000 tons; plates, 40,000 tons; wire, 8,000 tons, and miscellaneous 81,000 tons.

The Onskaka iron ore deposits at Golden Bay, New Zealand, are reported to contain 22,500,000 tons of high grade ore. They are situated on the coast in an ideal location, as the harbor is said to be sufficiently deep for the largest vessels to lie close in shore, and the deposits of ore are at a sufficient elevation to allow transportation by gravity from the mines to the docks. Limestone and coal also are said to exist in close proximity. No steps have so far been taken to develop the mines, but a company has been formed which will erect a blast furnace.

The Design and Construction of a New Gas Engine

Built by the C. & G. Cooper Co. in Both Horizontal Single and Twin-Tandem Types—Compressor and Electrical Units

Both horizontal single and twin-tandem, four-stroke, double-acting gas engines, in sizes from 200 to 3,000 horsepower, have been added to the line of engines built by the C. & G. Cooper Co., Mount Vernon, O. One of the most important features of this gas engine is the intake valve, which is designed to permit of the use of natural, producer, blast furnace, illuminating or coke oven gas, and the engine can be changed from one gas to another without stopping. The change is effected by a slight adjustment of the intake valve while the engine is in operation. The air, gas and water valves are conveniently arranged at one point, within easy reach of the engineer. When starting the engine, the compressed air and gas throttle valves are opened and the engine is turned over by the compressed air. After a few revolutions the air is replaced automatically by the explosive mixture and regular ignition begins in the cylinders. This is accomplished by four cams placed on the lay shaft which operate an equal number of poppet valves leading to the combustion chambers of each cylinder. These valves admit compressed air to the cylinders at the proper time to start the engine. After the explosive mixture has been introduced, and regular ignition begins, the compressed air is shut off by the combustion pressure in the cylinders acting against check valves. The compressed air throttle is then closed and the air inlet valves drop out of engagement with the cams by gravity.

Engine Governor

A Jahns governor maintains a uniform speed of the engine by varying the quantity of a constant mixture admitted to the cylinders to meet the load requirements. The governor controls the mixture of air and gas by imparting a rotative movement to a multi-ported throttling sleeve over each of the intake valves. Moreover, each multi-ported sleeve may be adjusted so as to vary the quantity of gas or air admitted to the mixture, thus permitting the exact proportion of gas and air to be selected which is best adapted to the most economical combustion. This adjustable feature of the throttling sleeve or mixing valve has been found to be of value in handling gases of different heat values, and has resulted in better regulation, high economy and increased power. An automatic safety stop shuts down the engine by tripping a switch in the ignition circuit whenever the engine speed reaches 10 per cent above normal.

The regulating qualities of the engine are due, in a measure, to the precision of the ignition system. Through the application of an improved mechanical make and break system, and method of driving the igniters, the sparks may be timed to a small fraction of the stroke, collectively by a single lever, or each one may be adjusted independently if desirable. The igniters are pointless and are double insulated to reduce short-circuiting to a minimum. The moving terminals are made of cast iron, while the stationary points are low carbon steel. Both are of ample cross-section to conduct the heat away rapidly. The oxidation caused by an electric arc between cast iron and low carbon steel is very small, which insures long life for the terminals. Each combustion chamber is fitted with two igniters, simultaneously in action, to produce rapid ignition of the fuel charge.

The engine is lubricated by a pressure-oiling system. A uniform pressure is maintained at all of the engine oil feeds by a pump controlled by a weighted valve, which automatically returns any excess oil to the filter through a by-pass. The rotary oil pump, which supplies oil from the filter to the pressure feeds, is driven by the engine, so that whenever the engine stops, the flow of oil is automatically shut-off, and when the engine starts, the flow of oil is again resumed under normal pressure. The roof tank, common to gravity systems, is dispensed with entirely. The oil, after being used, is caught and returned by gravity to a settling tank at the side of the en-

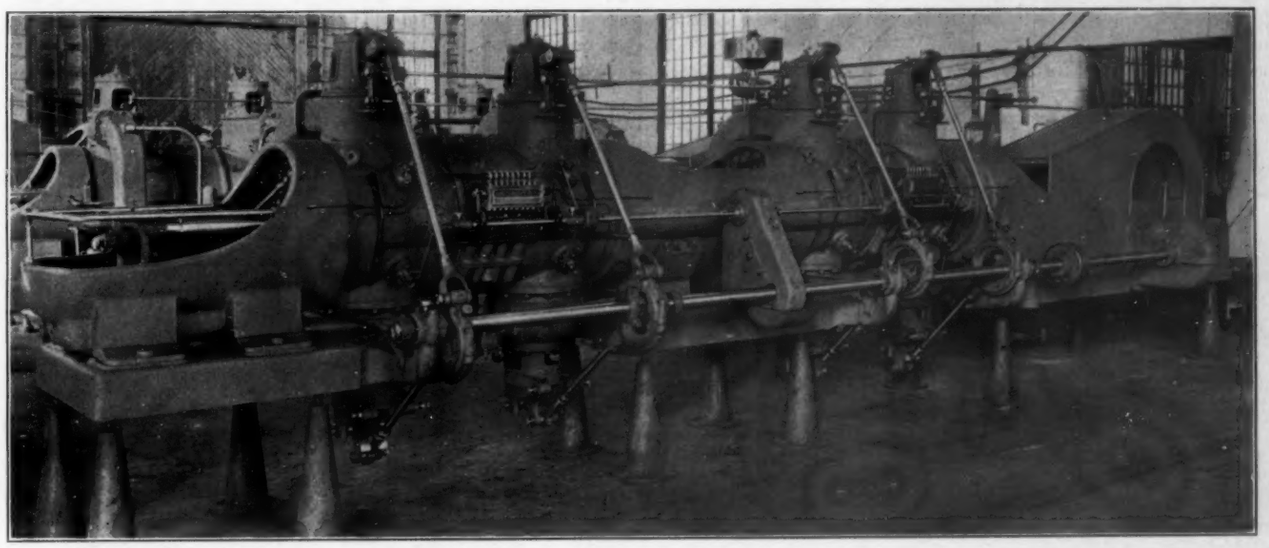


FIG. 1—COOPER, TWIN-TANDEM GAS ENGINE ASSEMBLED IN THE WORKS OF THE BUILDER AND READY FOR SHIPMENT

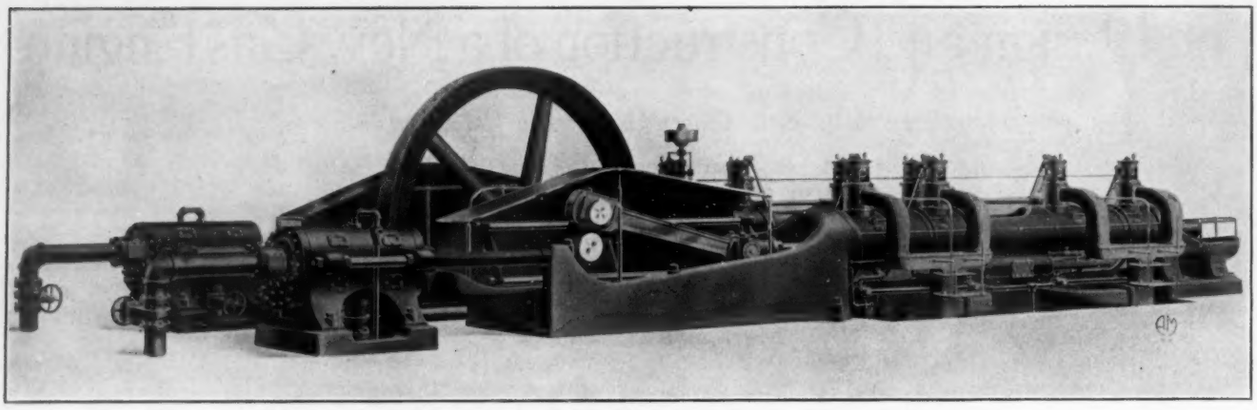


FIG. 2—COOPER, TWIN-TANDEM GAS ENGINE COMPRESSOR OUTFIT

gine foundation. From this tank the oil flows into the filter. The cylinders and piston rods are lubricated by multiple force feed pumps, driven from the igniter drive shaft. Lubricant is admitted to the piston rods through the metallic packings.

Cooling System

The cooling system embodies numerous ingenious features. The circulating water passes through the cylinder heads before entering the piston rods and pistons. The temperature of the water is thereby increased before being admitted to the rods, preventing sweating and insures proper lubrication. The water is admitted to each piston rod and piston from a telescopic intake pipe at the intermediate crosshead, and is discharged at the main and tail guide crossheads without reversal in the direction of flow. This reduces resistance and permits the cooling water to be taken from a supply having a low head. All water jackets are of ample area to allow free circulation. Separate water outlets from the cylinder jackets and piston rods discharge into open drain funnels, so that the temperature and continuity of flow from these points may be easily determined at any time. The amount of circulating water required is about 6 to 10 gallons a brake horsepower per hour.

The exhaust gases from the cylinders are delivered tangentially to the exhaust main, which in turn discharges them in the same manner to a muffler consisting of a cylindrical cast iron reservoir containing a perforated steel baffle plate. The exhaust gases, after spending their force in the muffling chamber, pass up through a central vertical pipe to the atmosphere.

The cylinders are made from a special mixture of hard, close-grained charcoal and remelted iron. They are symmetrical one-piece castings, provided with jacket bands made in three segments, and carefully designed to protect the cylinder barrels which take all the longitudinal strains. The jacket bands act as expansion joints, and provide ample and unobstructed passages for water circulation. The cylinders are supported in the counterbores of the main bed plate, distance piece and tail guide, which insures permanence of alignment. Both cylinders are held rigid by a complete circle of studs separate from those holding the cylinder heads. This permits inspection of either set of studs without removing the cylinder heads. As the piston and piston rods are carried by the cross heads the cylinders support their own weight only, and are free to expand and contract without straining the jacket walls. Access to the inside of the cylinders may be had through the inlet valve openings without removing the cylinder heads. The cylinder heads are water-cooled and carry the stuffing boxes for the piston rod packings.

The Pistons

The pistons are cast in one piece and are free from internal ribs to avoid casting strains. Each piston is fitted with three packing rings made in segments, having malleable iron keepers at the joints. The packing rings are set out against the cylinder walls by steel springs, and are constructed so as to distribute the lubricant to the best advantage. The pistons are forced onto the piston rods and, in addition, are held by flushed nuts. Special provision is made to insure free circulation of

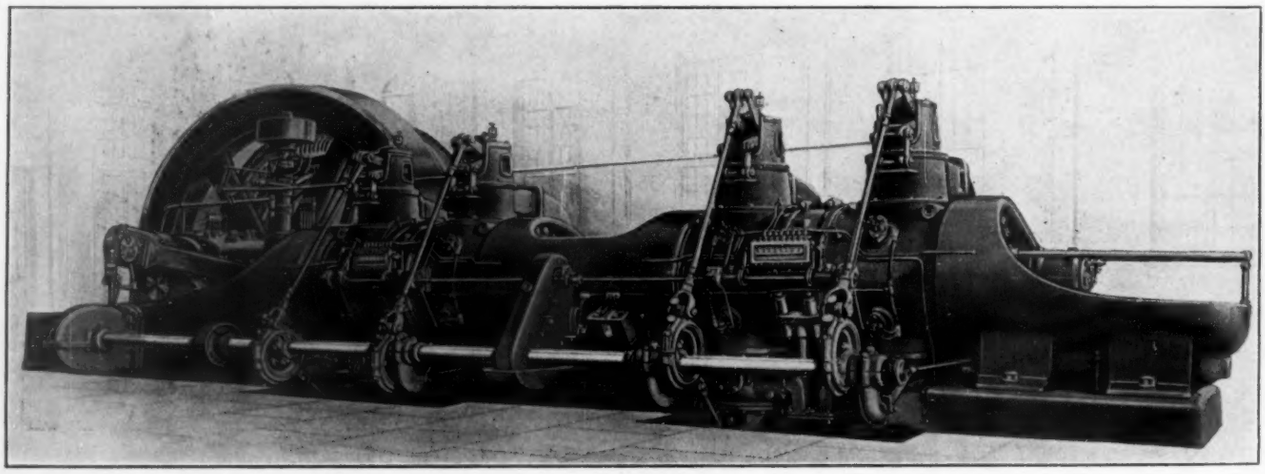


FIG. 3—COOPER, TWIN-TANDEM GAS ENGINE, DRIVING AN ELECTRIC GENERATOR

cooling water through the pistons. The pistons are supported by the rods and crossheads, and float clear of the cylinder walls, leaving only the packing rings in contact with the cylinders.

The piston rods are nickel steel forgings, drilled from both ends for water circulation. The rods are connected to the main, intermediate and tail guide crossheads. All piston rods are interchangeable. After being machined, they are ground on dead centers and highly polished. The piston rods are fitted with metallic packing of the sectional type, consisting of segmental cast iron rings placed along the rod in series. The packing includes two fire rings adjacent to each combustion chamber, which are compressed by external snap rings, and the remaining rings in the series are held in contact with the rod by garter springs. This type of packing embodies several original features and has given good results, as it remains tight through long periods of service.

Crossheads

The main and intermediate crossheads are made of open-hearth steel. The main crosshead is of the forked type and is connected to a flat, babbitted shoe by a cylindrical joint, in which vertical and rolling adjustments may be made. The main crosshead pin is made of high carbon steel. It is tightly clamped into both crosshead cheeks. A bolt and washer are counterbored into both ends of the pin so that part of the counterbore cuts into the crosshead body. This prevents the pin from rolling and keeps it in place endwise. The pin can be replaced quickly without loss of time for grinding and fitting. The intermediate crosshead, with its cylindrical shoe, acts as a coupling for the two piston rods and admits the cooling water which enters at the ends of the rods. No plugs are used in the ends of the piston rods, thereby permitting easy access for cleaning.

The distance piece between the cylinders is of heavy construction and rests in machined ways upon a base plate, to allow the cylinders freedom to expand and contract. This casting also provides two bored slides, one for the intermediate crosshead and the other for a water crosshead to admit the cooling water to the rods and pistons through tubes that telescope with water chambers. Free access to the intermediate crosshead is provided through the open top of this housing. The base plate underneath it supports bearings for the lay shaft, and on account of its central location is used to admit air from a pipe in the foundation for mixture with the gas at the intake valves of each cylinder. The tail guide, like the distance piece, is a cylindrical casting, and provides a slide for the tail rod crosshead. This casting is cored out to allow the escape of the cooling water from the rear piston rod.

Connecting Rod

The connecting rod is of the solid end construction and is made from open-hearth steel. The crank pin box is square, while the crosshead pin box is a circular shell, provided with an entering block. Both of these boxes are lined with babbitt metal and are adjustable for wear by means of wedges so located as to maintain the length of the rod always the same.

The side crank is a high carbon, open-hearth steel casting, having the counterweight and crank pin cast solid with it. In this way the pin may be the maximum allowable diameter, and being cast with the pin extending downward in the mold, a clean and homogeneous texture of metal is secured. The crank is forced onto the main shaft by hydraulic pressure and is keyed in place.

The main bed plate is of the Tangye rolling mill type, having broad bearing surfaces in contact with the foundations to which the bed plate is bolted. The open-top feature permits free access to the main crosshead and front cylinder head. The bottom of the bed plate is cast solid with it, and is piped for oil drainage. The metal is carefully distributed throughout to insure maximum rigidity and strength. The main journal window is cast solid with the bed plate and is fitted with removable shells having side adjustment by means of wedges. The lower shell rests in a bored seat and may be removed easily after being relieved of the weight of the main shaft. The cooling water from the front piston rod passes through the main crosshead into the side of the frame opposite the main bearing. Steps and hand railing over the main bearing afford ready access to the oil feeds and the governor. An easily removable, brass-bound sheet steel crank guard covers the moving parts and prevents waste of oil.

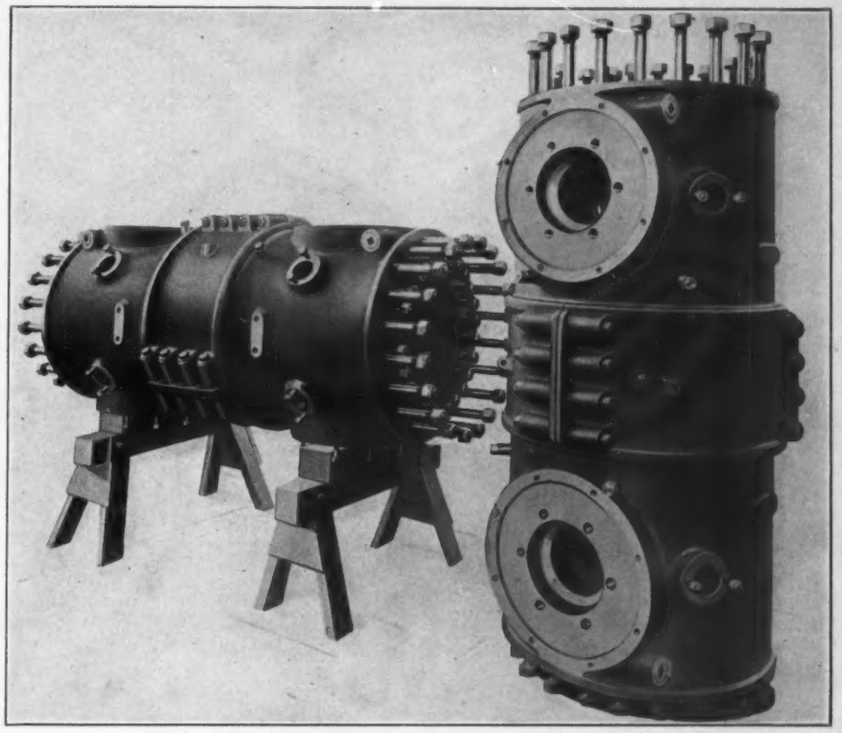


FIG. 4—CYLINDERS OF THE COOPER, TWIN-TANDEM GAS ENGINE

The Baldwin Locomotive Co. has been accumulating land for some time at Ridley Park, Pa., near its Eddystone works, for the purpose of colonizing its employes. At the present time most of them live at Philadelphia and are forced to commute daily. Although the company has made no definite statement, it is understood that substantial houses will be erected and that they will be rented at a very low rate.

The Development of the Steel Works Engineer[1]

With a Few Side Lights on the Duties of the Engineer Apart from the Routine of His Profession

By Alex. L. Hoerr

The writer's experience in the steel mills began at a time when the rolling of steel was being done to a large extent on mills that had been designed to roll iron, and were, therefore, not suited to the new requirements. Even the newer mills, designed for the service, were often inadequate, partly because of the inexperience of the designers and partly because the demands of the business grew so rapidly that the mills could not be kept in line with them. The constant demand was for tonnage. Day by day this demand grew and the mills had to satisfy it. New and larger sizes of the standard shapes were added to the rolling schedules as well as entirely new shapes, and as a result of these conditions breakdowns were very frequent. The men in demand were the master mechanics and their millwrights. Trained only in the hard school of experience, these men knew little of books or calculations. More than likely time could not be taken to determine the exact cause of the break and the only remedy applied was to make the new part stronger than the old. That this might and often did cause breakage in some other part of the mill or machine, could not be foretold, the only point was to get things going again quickly as possible.

Primitive Method of Locating Extensions

Foundations for new buildings or extensions, and for shears, tables and other machinery, were located in the field by means of a ball of carpenters' chalk line, a straight edge, and a spirit level. The new building was planned to be about parallel to some existing building or track, but seldom with any thought of what might be needed the next year.

Much of the machinery was designed in the pattern shop, and drawn up full size on large built-up boards. Pattern-makers and machinists worked to these drawings and when the job was completed the drawing was erased with a plane and everything was ready for the designer once more. Repair parts were obtained by having someone who remembered the job, visit the pattern storage house and by the aid of some mysterious sense of direction, pick out the pattern. The machinist went to the broken or worn out parts for his sizes and very frequently got them right.

The mechanical men of that period deserve great credit for the work they did for the steel mills. Without engineering education or elaborate mechanical equipment, they designed and built the plants that earned the money to pay for the successive steps to our present efficient equipment.

More Orderly Method of Working

As larger mills were built, with elaborate mechanical mill tables, shear tables and cooling beds, the need of a more orderly method of working became apparent. In some cases the master mechanic arose to the occasion and changed his methods, becoming, in fact, the engineer. In most cases, however, he leaned more and more heavily on the once despised draughtsman. The mechanical men could no longer take time to pick out the patterns, there was other and more important work for them to do. The number of parts in the plant had been greatly increased, with a corresponding increase in the number of spare parts which had to be carried. These parts were, as a rule, more highly finished than the parts previously carried and accurate drawings became a necessity. There had always been a few draughtsmen stuck in some dark corner of the plant, but they were not counted as of much importance. They were usually referred to in rather disrespectful language by the mechanical men, and if the truth be told, they often deserved it. The new conditions made necessary the employment of a large force of draughtsmen and also the organization of a field force to survey the ground, lay out the foundations for buildings and machinery, and supervise all construction.

The engineer, with this organization under his control, became a man of greater importance in the plant. He was called on to assist in many ways in the systematizing of numerous plant operations, beginning with a proper marking of his own drawings, and extending through the pattern shop into the foundries, machine shops and other finishing departments. Men from his department were detailed to follow the orders through the shops, expediting the transfers from one shop to another, interpreting drawings and making such changes as the development of the work made necessary. He could no longer be the designer of machinery for someone else to build, but on the contrary he must study carefully all of the processes involved and adapt his design to the facilities available.

In the field all locations for buildings and machinery were now carefully selected with regard to the future and many surveys and studies were made before excavations were started. In order that operations at widely separated points should have a definitely known relation to each other, standard base lines and elevations were established from which all surveys started. In many places the power end of the plant engineering grew up as a department distinct from the general engineering, while in other places they grew up together. In any case the problems were unchanged.

Power Plant Equipment

The old equipment usually consisted of flue or tubular boilers, simple, non-condensing engines and simple direct acting pumps. The electric power house was almost unknown except for a few belted arc machines. The boilers were all hand-fired and ashes were taken out in wheelbarrows or carts. Coal was cheap and nobody objected to the smoke which was accepted as the one best sign of prosperity. Into the midst of these conditions the engineer was projected in the course of his progress through the plant. The demand was not so much for changes which would save fuel as it was for changes that would make it possible to pull the loads with the existing engines and to get from the boilers enough steam to enable them to do it continuously. To meet this demand it was necessary to systematize the operations in the steam department. The firing of coal, cleaning the fires and blowing down the boilers in the various groups, were all arranged so as to interfere as little as possible with the production of a regular supply of steam both as to quantity and pressure. The boilers were cleaned more regularly and more thoroughly, and were carefully ex-

[1]Read before the Engineers' Society of Western Pennsylvania.

amined for both steam and water leaks. Steam pipe systems, which had grown with the works and had been extended in all directions without any calculations as to pressure drop, were reconstructed so as to give shorter runs to the various consuming points, thereby making available a higher average steam pressure. This, together with the adjustment of valves so as to balance the work in the cylinders and reduce the back pressure, gave a new lease of life to many engines, apparently antiquated.

Introduction of Stokers

As additions to the plant were made, water tube boilers and automatic stokers were introduced, sometimes with mechanical ash handling machinery, frequently without. Compound engines were adopted with much hesitation at first, and in many cases were operated for years without condensers. Later condensers were added, and until the advent of the low pressure turbine this was considered the most economical steam using combination possible. Some engineers maintain that this is still true.

The power plant grew greatly in size as motors replaced engines for driving the smaller auxiliaries in the plant, including the driving of shops, cranes, mill shears and tables, and the problem of the economical generation and transmission of electric power became of prime importance.

The reciprocating steam engine had this field to itself for a long time; but the high pressure turbine, the large gas engine using blast furnace gas and the low pressure turbine, have entered the field, in the order named, and are making strong bids for favorable consideration. Each no doubt has its place, it being the engineers' duty to determine when and where they can be used to the best advantage.

Economizers and superheaters for the steam plant have been used rather sparingly, but the tendency now is to figure on them very generally, especially in connection with the utilization of waste heat from various metallurgical operations.

Engineer and the Power Plant

In the plants where these various fuel saving devices were installed, it was quickly learned that their efficiency could only be maintained through constant and watchful supervision. It was not sufficient to install a feed water heater; it was necessary by some means to know the water temperature from day to day. It was not sufficient to install a compound condensing engine, it was necessary to indicate it at intervals to see that the load was properly distributed between the cylinders and that the condenser was maintaining a satisfactory low back pressure on the low pressure piston. All other equipment required similar watching to see that its original economical operation was maintained. In some cases, as previously mentioned, the master mechanic assumed this new work and carried it on successfully, but in most cases it passed to the engineer. As there was no important part of the works that did not use steam, water or electricity, and as the engineer was now largely responsible for their economical production and distribution, there was no important phase of the plant's operation with which he was not brought in close contact. Although still looked upon by the *practical* man as somewhat of a dreamer, he had an established place in the plant and was doing a work which became of more importance every day.

Today the power problem is being given careful and detailed consideration in many large plants by separate engineering departments, organized for the purpose of collecting and interpreting data. These studies are of value for many purposes; among others, to determine the conditions under which most nearly continuous operation is assured; to determine the conditions for most economical operation; to aid in accurately determining costs of various products by a proper distribution of steam, water, electricity, etc., to the various departments and to accumulate in available form data, from which the merits of proposed new equipment can be judged.

Power Plant Records

To this end records are kept of the steam and water pressures, of the condenser pressures, of the temperatures of boiler feed water and of condenser water, of the weight of coal and water supplied to the boilers, of packing and pump valve service, of lubricating costs, and in short as nearly as possible of all variables that affect the operation of the plant. The records are supplemented by records of numerous boiler, engine and pump tests made under operating conditions. All of these data are then available for study by interested parties either to throw light on certain cost sheet items or in connection with changes in equipment.

That the engineer has reached the limit of his development in plants of this character, the writer does not believe. Many men of engineering training and experience have reached important executive positions, and there are many reasons for believing that many more will do so in the future.

Expression has been given, however, more and more frequently of late, to a belief that will do much to prevent this. It has appeared in the engineering press and is frequently heard in the conversation of engineers. It is to the effect that the engineering profession is not properly recognized; that it does not receive financial rewards commensurate with the services performed, and that it does not receive the recognition in civic affairs which its interests demand and which its abilities merit. Much of this matter has about it a melancholy, disheartening sound; it professes belief in a most distressing state of affairs, blames it all on someone or something outside of the engineering profession, and looks for relief through some mysterious awakening of the other fellow which will enable him to see the engineer as the engineer now sees himself.

Financial Rewards

In the writer's opinion there is very little reason for such expressions and the instances in which conditions seem to be as represented, are almost entirely the fault of the engineers themselves. Financial rewards come to those who have for sale that which is in demand. It is not sufficient that a man be familiar with the laws of physics and mechanics or be able to calculate stresses in structures or solve problems in thermo-dynamics. Such knowledge is necessary for the engineer, but he may have it all and still be a mere calculating machine, differing from others only in height, weight or in the color of his hair.

In an age when technical education is so easily obtained such knowledge alone cannot win large rewards.

It is very easy to get men who can solve problems in mathematics and mechanics given the necessary data, but it is very difficult to get men who can assemble the data in proper form from the work in hand.

It is very easy to get men who can use steam tables and indicator diagrams in the solution of a power problem, but it is very difficult to get men who can see this power problem in the plant conditions.

Human Nature

It is very easy to get men who can sit at a desk and solve complicated problems in applied mechanics, but it is very difficult to get men who can go into the works or through the offices and solve the constantly recurring problems in applied human nature.

As engineers we have been taught that our profession is for the purpose of *subduing the forces of nature to the service of mankind,* but we have not been taught, to any considerable extent, that *human nature* is one of the forces to be subdued.

The Latest Scientific Works Reviewed

Primer of Scientific Management; by Frank B. Gilbreth; 103, 5 x 7½-inch pages; published by the D. Van Nostrand Co., New York City, and furnished by THE IRON TRADE REVIEW, for $1, postpaid.

The work is a compilation largely of answers to questions on the subject of scientific management, written by Mr. Gilbreth, the well-known author of works on the subject of the elimination of unnecessary waste in human effort. The introduction was written by Louis D. Brandeis, who states that the primer will prove of greatest value in helping to remove from the minds of workingmen misapprehensions which have led some well-meaning labor leaders to oppose a movement from which labor has most to gain. The subjects discussed by the author include principles of scientific management, application of the laws of scientific management, the effect of scientific management on the worker and its relation to other lines of activity. Definitions of the various terms of scientific management are included.

* * *

Concrete Costs; by Frederick W. Taylor and Sanford E. Thompson; 709, 5 x 8-inch pages; illustrated; published by John Wiley & Sons, New York City, and furnished by THE IRON TRADE REVIEW for $5, postpaid.

This work is designed to meet the demands of the contractor as well as of the engineer and architect and as the field covered is so broad, it necessitated the treatment of unit times and costs of concrete construction from the standpoint of rough approximate estimates, accurate detailed estimates, economical layout of work and scientific management with task and bonus. The book contains tables and recommendations for estimating the time and cost of labor operations in concrete construction and for introducing economical methods of management. Among the subjects discussed are the following: Approximate costs of miscellaneous concrete work, cost data on concrete structures, cost of reinforced concrete buildings, determination of labor cost, task work in construction, proportioning concrete, excavating and crushing stone for concrete, cost of concrete materials, machinery plants for mixing and handling concrete, forms of reinforced concrete, together with tables of quantities of materials for concrete and mortar, tables of concrete volumes, tables of steel areas and quantities, tables for designing forms, etc. An estimate sheet is included with an example showing the use of tables for making bids on work.

* * *

Metallurgy of Cast Iron; by Thos. D. West; 631, 5 x 7½-inch pages; 153 illustrations; published by the Penton Publishing Co., Cleveland, and furnished by THE IRON TRADE REVIEW for $3, postpaid.

The fourteenth edition of this well-known work has been thoroughly revised and considerable information has been added. This includes notes on the author's most recent experiments and researches, present use of by-product coke, advantages of high carbon in coke, advisability of considering the total carbon in mixtures, segregation of sulphur and manganese in castings, use of ferrophosphorus, notes on experiments with titanium and vanadium, notes on semi-steel, the volume relation of white and gray cast iron, non-expansion of white iron by repeated heatings, and the similarity of defects in chilled iron and steel car wheels.

In the preface to the fourteenth edition, Mr. West states that the report of his recent investigations of the gray iron chilling problem may form a part of an entirely new work, although it may be added as an appendix to some future edition of the Metallurgy of Cast Iron. The author has discovered how to create an inside chill and he is of the opinion that there may be more than one process for accomplishing this. The present edition indicates how widely this work has been distributed.

* * *

Basic Open-Hearth Steel Process; by Carl Dichmann; translated and edited by Alleyne Reynolds; 334, 5¼ x 8½-inch pages; illustrated; published by the D. Van Nostrand Co., New York City, and furnished by THE IRON TRADE REVIEW for $3.50, postpaid.

This work, originally published in German, was translated by Alleyne Reynolds and aside from the removal of a few inaccuracies in the text, the translation is as literal as the differences in the two languages will permit. The work is divided into two parts and in the first section are discussed the physical condition in an open-hearth furnace system, operation of gas producers, etc. The second part is devoted to the chemistry of the basic open-hearth process and discusses the chemical action of the flame upon the formation of scale, slag and impurities in the metal. A chapter is devoted to the principal working methods of the basic open-hearth furnace process, including the pig and scrap-carbon, pig iron process with cold charges, pig iron process with molten charges, Talbot, combined, Bertrand-Thiel and Monell processes. The appendix contains a large number of tables and formulae which should prove of great value to the open-hearth furnace operator.

* * *

Cast Iron; by W. H. Hatfield, 249 6 x 9-inch pages; published by Chas. Griffin & Co., Ltd., London, and furnished by THE IRON TRADE REVIEW for $3.50 net.

The results of many researches on the nature and properties of cast iron and the scientific principles underlying their manufacture are combined in this work. Much of the subject matter is the result of the author's own investigations and covers many years of experiment. The work opens with a discussion of the iron-carbon alloys and cast iron from the standpoint of the equilibrium diagram and the succeeding chapters deal with the influence of other constituents, such as silicon, phosphorus, sulphur, manganese and the rarer elements. The remainder of the volume is devoted to a consideration of the influences incidental to the modes of manufacture, such as casting temperature, shrinkage, contraction and heat treatment generally. Many of the researches described consist of the work of eminent metallurgists and the author has endeavored to make a fair presentation of their views. The work is well-illustrated and contains a brief glossary of the more important terms now current in metallurgical literature. With few exceptions the definitions are those recommended by the nomenclature committee of the British Iron & Steel Institute.

A Permanent Steel Stockpile Trestle for Ore

Erected at the Negaunee Mine of the Cleveland-Cliffs Iron Co.—Can be Used For Limestone, Coal, etc.

In underground iron mining operations the problem of stockpiling is always present. Even when the market is good, so that the entire production of the mine can be sold without delay, it is necessary to stock the ore which is mined during the winter until the opening of navigation in the spring. For convenience in stocking, it is customary to build wooden trestles about 20 feet high and of the requisite length on either side of the head frame or shaft house. The ore from the mine is dumped into tram cars operating on these trestles which distribute it to the stockpiles. When the time arrives to ship the ore, steam shovels are used to transfer the material from the stockpile to standard railroad cars. The wooden trestle is, of course, buried in the stockpile and must be destroyed in order to remove the ore by steam shovel. The piles and bents are too close together to permit the steam shovel to operate without removing the trestle as the work progresses. As a result, it is necessary to constantly rebuild the wooden stockpile trestles. This is a source of considerable expense. To avoid the difficulties attending the use of wooden stockpile trestles, the Cleveland-Cliffs Iron Co. has designed and built

FIG. 1—PERMANENT STEEL STOCKPILE TRESTLE

a permanent steel stockpile trestle in connection with its improvements at the Negaunee mine, Negaunee, Mich.

This trestle, Fig. 1, is a radical departure from the accepted designs for structures of this class. As indicated in the illustration, it consists of a series of steel tubes supporting two box girders carrying the tram tracks. Two trestles have been constructed, one on each side of the headframe. Each one consists of eight 114-foot bents, together with a 19-foot overhang, making the total length of the trestle 931 feet from end to end. The tram tracks are 42 feet from the ground and are 20 feet apart, center to center. It is clearly evident that on account of the distance between the tubes or piers, together with the height of the structure, it will be possible for a steam shovel to work through the stockpile without difficulty and without injury to the trestle.

The foundations for each bent consist of three reinforced concrete blocks,

FIG. 2—FOUNDATIONS AND REINFORCING FOR PIERS OF STOCKPILE TRESTLE

shown at *B*, Fig. 2, the lower block being 24 feet long and 10 feet wide. The total height of the foundation is approximately 6 feet. The steel tubes are securely bolted to the foundation blocks. Each tube is 48 inches outside diameter and approximately 36 feet long. It is built of ¼-inch plate with riveted lap joints. The tubes are filled with concrete reinforced by a cluster of vertical steel rods, as shown in Fig. 2.

On the top of each tube or pier is a platform or grillage work, built of 6-inch, 12½-pound I-beams. This platform is 26 feet square and is securely braced with diagonal struts, as indicated in Fig. 1. It carries the two box girders which in turn support the larry tracks. The girders over each pier are 38 feet long, the gaps between being filled by 76-foot box girder spans of similar construction. The girders consist of two ¼-inch web plates, 42 inches deep, reinforced on the flanges by four 6 x 4 x ⅜-inch angles.

Operating the Larries

The larry tracks are 30-inch gage and the two cars which run the entire length of the trestle, are operated by an endless rope haulage. An operator stationed in a cabin near the trestle runs the cars by means of a controller. The haulage ropes are operated by 50-horsepower induction motors, situated in the shaft

house about 16 feet from the ground. The cars run out on a curved track connecting the shaft house with the two stocking trestles.

The shaft house is steel and is of similar construction to those erected by the Cleveland-Cliffs Iron Co. in the North Lake district. The top sheaves are 100 feet from the collar of the shaft and the chutes are arranged so that the skips can dump either into tram cars or into railroad cars. The ore from the skips is dumped into a pocket containing two chutes operated by a valve so that the operator can turn the ore in either direction. The larry cars are directly below, and in case it is desired to load railroad cars, the ore is dumped through the trestle into chutes leading out to tracks on either side of the shaft.

The Shaft

The shaft at this mine is a circular affair 17 feet inside diameter, with concrete walls, 18 inches thick. The concrete shaft, which was sunk by the Foundation Co., New York City, extends from the collar to the bottom of the mine, a distance of about 900 feet. There are two levels at present, the ninth and tenth, both joined to the corresponding levels in the old shaft, situated several hundred feet east. The shaft is divided into four compartments including two skipways, one cageway and one ladder and pipeway. The sets consist of 8 and 6-inch steel channels situated 10 feet apart.

In the two pipeways, which are situated on either side of the ladderway, there is a 12-inch water column, a 6-inch air line and a 12-inch pipe for the cage counterweight. This counterweight is a steel shaft 18 feet long and 11 inches in diameter, weighing approximately two tons. There are also four electric cables running down the shaft. One three-conductor, 2,300 volt, lead-armored cable will be used to supply current for the pumps. One eight-conductor, 110-volt cable carries the signal bell and telephone lines and the remaining two 250-volt conductors are for the current for the underground locomotives.

Landings

In the ladderway there is a landing every 10 feet, with a wood platform. As soon as a landing is reached, the miner walks on the wooden floor to the opposite end of the compartment where he continues his ascent. The cage runners are maple, reinforced by 6-inch channels and the skip runners also are 6-inch channels. The skips are of the Kimberly type of five tons capacity and are run in balance. The cage is 5 x 10 feet in size and will hold about 25 men. It is completely enclosed with doors at each end and is provided with safety catches which grip the runners in case the rope breaks.

The walls and hangings of the two levels are concreted for a distance of 60 feet from the shaft. The ore is hauled to the shaft from the stopes in the mine in 3-ton cars, pulled by electric locomotives. It is dumped into storage pockets with a capacity of about 40 tons each. From the storage pockets the ore is run into measuring pockets which have a capacity of 5 tons, equal to that of the skips. It is then dumped directly into the skips. The gates for both pockets are operated by air. The measuring pocket enables the skip-tender to load with practically no delay. The skips carry the ore to the surface and dump it either into railroad cars or into the tram cars leading to the stockpile trestle described.

The permanent steel stockpile trestle was fabricated and erected by the Wisconsin Bridge & Iron Co., Milwaukee. The design is such that it could be applied also in stocking limestone, sand, coal or similar material.

Reviews of New Catalogs

SPECIALTIES.—The Gem Mfg. Co., Pittsburgh, has issued a catalog describing the steel and brass oilers, flexible shafts, dies, special stamping, etc., which it manufactures.

POSTS AND FENCES.—Some interesting illustrations are used to help describe iron railings, wire fences and entrance gates in a well-arranged catalog issued by the Anchor Post Iron Works, 165 Broadway, New York.

TURBO BLOWERS.—The Coppus turboblower for mechanical draft and other industrial purposes is explained in a booklet issued by the Coppus Engineering & Equipment Co., Worcester, Mass.

DROP PRESSES.—The Standard Machinery Co., Providence, R. I., has issued a catalog devoted to drop presses. Illustrations showing the general design and construction of the machines are included.

VERTICAL BRIDGES.—"The Evolution of Vertical Lift Bridges" is the subject discussed in a pamphlet issued by Henry Grattan Tyrrell, bridge and structural engineer, Evanston, Ill.

DRILLING MACHINES. — The Fosdick Machine Tool Co., Cincinnati, in two circulars, illustrates and describes its new style 2½-foot and 3-foot radial drilling machines. Both tools recently have been re-designed.

METERS.—"Combustion and the Cost of Power" is the title of a booklet recently issued by the Uehling Instrument Co., Passaic, N. J. The importance of boiler room economy and the part economy plays in all branches of industry are outlined.

PUMP ENGINES.—The Standard Pump & Engine Co., Cleveland, has issued an attractive 40-page catalog showing designs of pumping engines adapted to shallow wells, cisterns, lakes, rivers, etc., and others adapted to pump from deep wells.

COLD METAL SAWS.—The science of cutting metals cold is discussed in a bulletin of nine pages issued by the Lea Equipment Co., Philadelphia. One of the saws is illustrated and a comprehensive description of the machine follows.

DRILL INDICATORS. — "The Indicator Book" is the title of an attractive 48-page catalog issued by the Trill Indicator Co., Corry, Pa. The catalog is handsomely bound and affords interest for all engineers. Besides containing a full description of the various types of indicators, reducing wheels, indicator fittings, planimeters, etc., the book contains a large amount of matter of value to engineers.

GRINDING WHEELS.—Balancing grinding machines are described in a recent issue of Grits and Grinds, a bulletin published by the Norton Co., Worcester, Mass. Abstracts from a number of trade publications, relating to grinding and grinding wheels, are included.

CRANES. — Pillar cranes, hand wrecking cranes, mast jib cranes, pillar jib cranes, bracket jib cranes, hand bridge cranes and transfer tables are illustrated and described in a catalog recently issued by the Brown Hoisting Machinery Co., Cleveland.

STEAM PUMPS.—Many good qualities of the Cameron steam pump are described in a recent pamphlet issued by the Ingersoll-Rand Co., 11 Broadway, New York. A number of pumps are illustrated and dimensions also are given.

SMALL METAL SPECIALTIES. — The National-Acme Mfg. Co., Cleveland, has issued a uniquely-bound catalog describing "Parts for the Trade." Spark plugs, special screws and nuts, carburetors and magnetos, etc., are illustrated.

RECORDERS. — The Bristol Co., Waterbury, Conn., has issued a 64-page catalog describing and illustrating recording pressure and vacuum gages. Full-size facsimile sections of a 12-inch chart with the record of the draft in the stack of a boiler is one of the interesting features of the catalog.

WELDERS.—In a handsomely bound booklet containing 72 illustrated pages the Thomson Electric Welding Co., Lynn, Mass., tells about electric welding machines, and enumerates some of the advantages of electric welding. The electric welding machines described in the catalog do not require skilled labor to operate.

STEEL VALVES.—A mine of information about steel valves is contained in a well-arranged catalog issued by the Nelson Valve Co., Philadelphia. It contains 64 pages and shows steel valves made of acid open-hearth steel. One can easily find the particular kind of a valve he's looking for—so well is the catalog arranged—and an unusually large assortment of valves is described.

Laminated Seams and Split Head Break Rail

Report of Government Investigation Into Cause of Defective Rail Which Resulted in Great Northern Accident

The broken rail which caused the accident on the Great Northern railway near Sharon, N. D., Dec. 30, 1911, was examined by James E. Howard, engineer-physicist of the United States Bureau of Standards, and it was found that there were two defects in the rail, consisting of laminated seams, which weakened the base, and a split head. The track was laid with 85-pound rails 33 feet in length and the temperature at the time of the accident was 18 degrees below zero. The rail was rolled in 1906 and was laid in the track on Aug. 30, of that year. After the accident, the receiving end was found intact for a distance of 18 feet 7½ inches, while the leaving end was intact for a distance of 8 feet 11½ inches. The intervening section, 5 feet 5 inches in length, was broken into many pieces, 18 of which were recovered.

Examination of the Rail

An examination of this rail showed that, although the head was split for a length of nearly 9 feet, the initial rupture at the time of the derailment was a crescent base fracture; although the rail was in a weakened condition by reason of the split head. The initial fracture was followed by a fracture of the web and head and other lines of rupture followed in succession. In his report to the Interstate Commerce Commission, Mr. Howard states that it is characteristic of crescent-shaped flange breaks to have practically no display of extension of the steel across the laminations. Rails display ample extension when a metal is strained in the direction of the length of the rail parallel to the length of the lamination, but in a cross-wise direction they show great brittleness. Mr. Howard further states that wherever there is a lack of structural continuity in the steel, brittleness may prevail when it is over-strained at right angles to that lack of continuity. Stresses may more readily reach the necessary maximum in the base than in the head, which probably accounts for the fact that flange breaks are more numerous than split heads. From the examination of this rail it may be inferred that defects in the base are of a more grave character, relatively, and lead to more rail fractures than defects located in the head of the rail. Laminated seams are regarded as a common cause for many of the base fractures and split heads.

Carbon Variations

Mr. Howard's report further shows that there was no slag along the line of the fissure or split head and that its probable origin was at a point where the steel was much higher in carbon content than in other portions of the rail. It also appears that there was a segregation of phosphorus and sulphur. The split head, Mr. Howard states, was undoubtedly caused by the combination of high carbon steel at the center of the head with laminated seams interposed between that and the medium carbon steel at the outside of the rail. The carbon content of the steel at different points varied from 0.37 to 0.77 per cent. The analysis of the test ingot from the heat from which the rail was rolled showed a carbon content of 0.53 per cent. In commenting upon this variation in carbon content, H. W. Belnap, chief inspector of safety appliances, reports as follows: "This analysis is supposed to represent the heat, but if the heat does not represent the rails produced therefrom, the analysis would seem to be of no particular value, as it would be useless to refer to the composition of a rail as being of a certain per cent carbon when one part contains 100 per cent more carbon than another part."

Brittleness Tests

Since Mr. Howard's report shows that cross-wise stresses are held to be directly accountable for flange breaks in the base of rails in service, Mr. Belnap concludes that it is apparent that tests should be required for the purpose of determining the brittleness of the metal when subjected to such stresses. The laminated seams, which were primary causes of this rail failure, are considered defects of manufacture and the report states that current specifications, as well as tests made before acceptance, are not sufficient to insure the discovery of such defects.

The number of rail failures which occur on the railways of the United States is constantly increasing. On the Great Northern railway during the months of November and December, 1911, and January, 1912, there were 2,760 rail failures, of which 936 were due to defective rails. An interesting feature in this connection is the fact that of these 936 defective rails, 605 were 90-pound rails made in the years 1908, 1909, 1910 and 1911. Of approximately 600 rails which failed on one division of the Great Northern during 1910 and 1911, 80 per cent were caused by fractures starting from seams in the base of the rails while only 20 per cent showed no signs of defects.

Conclusions

In summing up the results of his investigations, James E. Howard makes the following observations:

Specifications governing the acceptance of rails are inadequately drawn to exclude from acceptance defective rails.

One of the most common types of rail fractures is not guarded against by current specifications referring to the base fractures of the crescent-shaped type. These defects in part have their origin in the metal while in the state of the ingot.

The chemical analysis of the usual test ingot does not furnish assurance of the chemical candition of the finished rail.

The presence of interior defects of a serious character which have caused a great number of rail fractures, is not revealed by the drop test.

Galvanizing Works Started

Pittsburgh, July 9.—The De Forest Sheet & Tin Plate Co. has started its new galvanizing equipment, just installed, which is said to be the largest of its kind in the country. The plant at Niles, O., is able to galvanize up to the extreme width of 54 inches in all gages from No. 10 and lighter. The company is using a new method of treating and pre-treating sheets which gives, it is said, a greater uniformity of coating. The improvements that brought this about have been under way for several weeks.

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Defiance and Delay

The full report of the recent decision of the supreme court of the District of Columbia, sentencing Gompers, Mitchell and Morrison to jail for criminal contempt in violating the injunction issued in behalf of the Buck's Stove & Range Co., illustrates the delays of the law in a striking manner and discloses the astonishing audacity of the defendants. Both of the great political parties in their national platforms recently adopted have urged the enactment of legislation to rid the present legal system of the delays, expense and uncertainties, which are now so notorious. We know of no place in which this proposed reform is more imperatively needed than in injunctions and contempts, as illustrated by the case of these labor leaders.

The case originated nearly six years ago and grew out of a strike at the plant of the Buck's Stove & Range Co., at St. Louis. Mr. Gompers and his associates of the American Federation of Labor declared a boycott in their organ. The supreme court of the District of Columbia ordered the publication of the boycott discontinued, and, when this injunction was violated, sentenced Gompers and associates to prison. The case was appealed by the defendants to the supreme court of the United States, which decided that the injunction did not violate the right of free speech or free press, as claimed by the defendants, but held that the proceeding in which they had been sentenced for contempt was erroneous in form. The case was, therefore, sent back to the lower court, and the defendants were again tried and found guilty. They were called upon to say whether they were willing to acknowledge their error and to assure the court that they intended to obey such orders of the judges in the future. This they refused to do. Hence, the court could not, with any self-respect, fail to pass sentence. In its recent decision, the court says:

The defendants are here, at the court's bar, to answer; they have been afforded full opportunity to hear the evidence against them, and to say what, if any, reason can exist against their punishment. *Every part of their response, for they offer no defense, is measured by the words of their leader, Gompers: "The things I am charged with, I did. * * * * Go to ———— with your injunctions."*

There is no room for temporizing; they are ready to repeat in equally determined fashion the sedition of the past; all assurance to the contrary they have themselves distinctly and definitely refused to give. Lawless as are their teachings, they still proclaim them; to them persistently adhere, and still incite the ill-disposed to follow.

Where else does the history of jurisprudence show so bold, so broad, so effectual contempt of the judicial arm of government as here? When before, has an instance occurred where the power of established sovereignty was rendered forceless and the law for a case was made to fail in its effort to secure to an outraged citizen, the establishment and vindication of his rights.

Defying the law and posing as martyrs, the defendants received their sentence, gave bond, and will appeal to the district court of appeals, where the case will be heard in October. This seems very much like a travesty of justice. The facts were very simple and yet the defendants, standing out against the majesty of the court, found it possible to put off the day of judgment from time to time until the effect, which would have resulted from prompt punishment is lost to a large extent. We believe that the law should be such as to make it possible promptly and severely to punish any man who defies the laws of his country and the decisions of its highest courts. Technicality should not be permitted to keep him out of jail where he belongs.

Increase in By-Product Coking

The manufacture of coke by the by-product process gains steadily. In 1911, when the total production of coke decreased, the by-product output increased. There was a decrease of 22.3 per cent in the output of beehive coke and a gain of precisely 10 per cent in the output of by-product coke.

While the by-product process is gaining, it has not been gaining in very recent years at any very striking rate. This is shown by the statistics of production. The first year for which the tonnage was reported was 1893, with 12,850 tons of 2,000 pounds. Seven years later, the output reached the dignity of seven figures, just exceeding a million tons, which involved the very heavy percentage gain which generally comes with a new industry. In 1901, the output was 1,179,900 tons, in 1906, 4,558,127 tons, and in 1911, 7,847,845 tons. Thus in five years, 1901 to 1906, the gain was 3,378,227 tons, while in the next five years, 1906 to 1911, the gain was 3,289,718 tons, a smaller tonnage gain in the second five years than in the first five. This is not the kind of gain which usually occurs in a new industry. The most common thing

is for the annual gain in quantity to increase, while the percentage of gain decreases, but here we have a slight decrease in the quantity gain. The proportionate gain was 286 per cent from 1901 to 1906, and 72 per cent from 1906 to 1911.

What appears to be a slow rate of gain for by-product coking is really a very rapid rate, considering all the conditions. It is easy to increase the output of beehive coke. Most of the increase which has occurred in the past dozen years, or since the opening of the Klondyke or Lower Connellsville, has been by the building of additional beehive ovens at existing plants, a simple process considering that the operators involved were making money, and risked little capital because often they owned the coal already, and were merely planning to exhaust the coal more rapidly, thus in one sense decreasing their risk. By-product coking, on the other hand, involves the building of a relatively expensive plant, and as a rule also the purchase of the coal acreage, so that the undertaking involves much more financing and much more careful figuring. Viewed from this standpoint, the increase in the practice of the by-product process should be regarded as satisfactory even by its warmest friends.

Below we append a table showing the production of by-product coke from the beginning of the statistics, with the total production of coke, both in short tons, with a computation of the percentage of by-product to total coke. To this we append a statement of the number of short tons of coke produced, to each gross ton of pig iron produced in the same year, a comparison which is sometimes regarded as of interest. The coke figures do not include gas house coke. The coke reported is chiefly metallurgical fuel, though some is used for household and other purposes.

Year.	By-Product Coke.	Total Coke.	Per Cent of By-Product.	Coke to Pig Iron.
1893	12,850	9,477,580	0.1	1.33
1894	16,500	9,203,632	0.2	1.38
1895	18,521	13,333,714	0.1	1.41
1896	83,038	11,788,773	0.7	1.38
1897	261,912	13,288,984	2.0	1.39
1898	294,445	16,047,209	1.8	1.36
1899	906,534	19,668,569	4.6	1.44
1900	1,075,727	20,533,348	5.3	1.49
1901	1,179,900	21,795,883	5.4	1.37
1902	1,403,588	25,401,730	5.5	1.42
1903	1,882,394	25,274,281	7.4	1.42
1904	2,608,229	23,661,106	11.0	1.43
1905	3,462,348	32,231,129	10.7	1.40
1906	4,558,127	36,401,217	12.5	1.44
1907	5,607,899	40,779,564	13.8	1.58
1908	4,201,226	26,033,518	16.2	1.63
1909	6,254,644	39,315,065	15.9	1.52
1910	7,138,734	41,708,810	17.1	1.53
1911	7,847,845	35,555,362	22.1	1.50

Taking Lessons from the Steel Industry

In a recent issue of the *Chicago Record-Herald* appears an editorial commenting on the fact that the New York Central Railroad system has recently appointed a "general safety agent", whose duty it is to study the accidents that occur and give advice tending toward their prevention. This move on the part of a great railway system is strongly commended by the *Record-Herald* and its action is held up as an example for other corporations to follow. It is indeed gratifying to know that "America's greatest railway system" has finally awakened to the fact that accidents may be prevented and reduced by the systematic work of a safety department under the direction of a general safety agent. All of the prominent companies in the steel business in this country have been working along these lines for many years and a safety department is no new thing in the organization of a steel plant. In a recent circular issued by E. H. Gary, chairman of the United States Steel Corporation, it is shown that the sum of $5,450,000 is expended annually in the work of preventing accidents by this one corporation. The recent action of the New York Central indicates that the broad-minded course of the steel industry is finally having its effect in other lines of business.

Northern and Southern Pig Iron

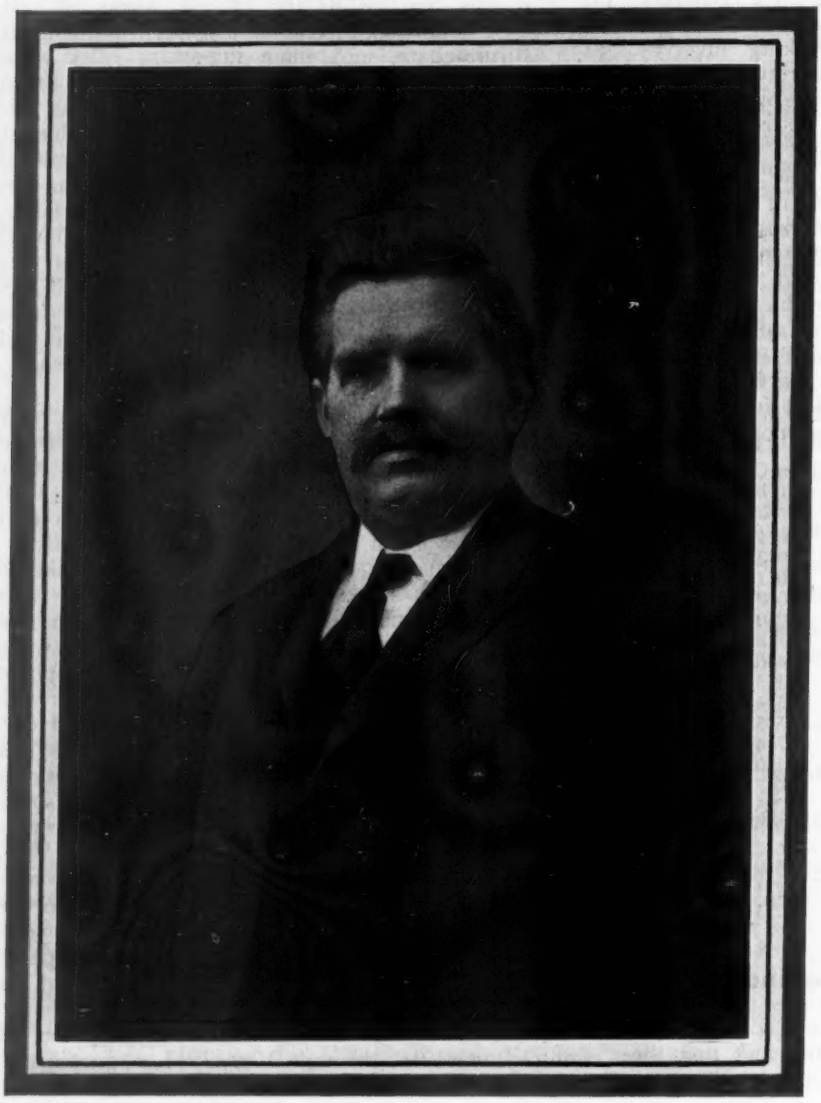
Prices of southern and northern pig iron have gotten decidedly out of their usual relation in the past six or seven months. A low point in all grades of pig iron was reached in the closing weeks of last year, when southern iron became openly quotable at $9.75, Birmingham, and some important sales were understood to have been made at about $9.50. From that low point to the present, southern iron has advanced $2 a ton, the market being now quotable at $11.50, Birmingham. Northern irons have advanced by various amounts, but the average advance has not been as much as 75 cents. The disparity is striking, for as a rule southern and northern iron have moved fairly together, though generally southern iron has been the more sensitive, and has advanced and declined slightly before northern iron. This is perhaps the first time on record when southern iron has led northern iron by a period of months in any striking change.

General conditions between the two districts may have changed, but the change has hardly been a striking one. Lake Superior ore is lower this year than last. Coke, on the other hand, is higher, and the total cost of the raw materials required to make a ton of pig iron in the north cannot have changed greatly.

This would be a good time for those who like to draw comparisons to argue that the price of Lake Superior ore should advance. The ore trade can readily remember how in the winter of 1909-10, when there was an advance in Lake Superior ore, complaint was made that the ore advance was out of line with general conditions, because southern iron had not correspondingly advanced. In THE IRON TRADE REVIEW of Jan. 27, 1910, this matter was discussed, and it was suggested that the use of statistics to show that something was out of joint was not appropriate. The time has arrived when the shoe is on the other foot. Were southern iron to be taken as a criterion, then a large advance in Lake Superior ore would now be in order. Using merely the line of argument which two years and a half ago was used to show that Lake Superior ore was too high, the fact can now be pointed out that southern iron is $11.50, whereas in the calendar year 1910 it averaged about $11.60, and in the 12-month, June, 1910, through May, 1911, approximately the period of consumption of 1910 ores, the average was almost precisely $11. Therefore, using this style of argument, prices for Lake Superior ore are entitled to be at least as high as those for 1910. The fact is that they are about $1.25 lower for Bessemer and $1.15 lower for non-Bessemer. It is not the intention here to urge that the market price of southern iron should dictate the price of Lake Superior ore, but merely to point out that the justice of our criticism of this line of argument two and a half years ago is borne out, unless it be admitted that the reverse conditions should now be utilized as an argument.

MEN OF THE IRON TRADE

James H. Nutt, of Youngstown, O., commissioner of the Western Bar Iron Association, was in many ways responsible for the recent successful agreement between rolling mill employers and the Amalgamated Association of Iron, Steel and Tin Workers and the United Sons of Vulcan. He is probably the leading authority



JAMES H. NUTT

in the middle west on the history of wage scale agreements, with particular reference to rolling mill wage scale agreements. He has been commissioner for some years for the Western Bar Iron Association and has his office in the Dollar Savings Bank building. Mr. Nutt was at one time a heater in the mills of the old Brown, Bonnell & Co., Youngstown, and was for years a member of the Amalgamated association, having been a trustee of that organization. Later he was engaged as secretary of the Mahoning & Shenango Valley Manufacturers' Association and held the office until the association disbanded in the late 90's. His acquaintance with all matters and men pertaining to rolling mill practice is as extensive as that of any man in the country.

S. F. Bowser, president of S. F. Bowser & Co., Fort Wayne, Ind., who is in Europe on a pleasure and business trip, expects to return to this country in September.

Daniel G. Reid, a director of the United States Steel Corporation, expects to sail this week for Europe.

Frank M. Eaton, of Hickman, Williams & Co., Cincinnati, is spending his summer vacation in the Rocky Mountains.

Dr. F. Schniewind, of the United Coke & Gas Co., 17 Battery Place, New York, is expected home this week from a European trip.

Frederick Allart, connected with the New York office of the Lukens Iron & Steel Co., sailed on the Olympic July 6, for Southampton, Eng.

E. A. Donville, formerly vice president of the Nevius Castings Co., Philadelphia, is now with the New York Car Wheel Co., Buffalo.

W. C. T. Carpenter, a director of the United States Cast Iron Pipe & Foundry Co., has been made a member of the executive committee.

C. H. Domhoff, of the Domhoff & Joyce Co., Cincinnati, pig iron and coke merchants, is enjoying a vacation at Bemus Point, New York.

Paul Messer, engineer of the Yokohama office of the American Trading Co., New York, is in that city, conferring with officials of the company.

Chas. G. Gates has been elected a member of the executive committee of the United States Railroad & Improvement Co., New York, to succeed his father, the late John W. Gates.

W. H. Schafer, general superintendent of the Cincinnati-Bickford Tool Co., Cincinnati, O., has resigned to accept the position of vice president of the Rivett Lathe Mfg. Co., Boston.

Marion A. Morris, formerly superintendent of the Blake & Johnson Mfg. Co., Waterbury, Conn., has been appointed superintendent of the J. H. Sessions & Sons Co.'s plant at Bristol, Conn.

Charles J. Brown has been appointed superintendent of the Emma blast furnace, Cleveland, of the American Steel & Wire Co. Mr. Brown is a graduate of Case School of Applied Science, Cleveland.

H. S. Philbrick, formerly assistant professor of mechanical engineering at the University of Missouri, has been appointed professor of mechan-

MEN OF THE IRON TRADE

ical engineering at Northwestern University, Evanston, Ill.

James F. Walsh, general superintendent of motive power of the Chesapeake & Ohio railway, has resigned. He entered the railway service as a machinist apprentice, and is considered a mechanical expert.

James H. Hoyt, Samuel Mather, William G. Mather, W. Bingham and J. H. Wade, all of Cleveland, directors of the Cleveland-Cliffs Iron Co., that city, have been visiting properties of the company at Marquette and Ishpeming, Mich.

John A. Allen, recently purchasing agent of the Hubbard Steel Foundry Co., at Chicago, has been made purchasing agent of the Brier Hill Steel Co., at Youngstown. Mr. Allen was formerly purchasing agent for the Lackawanna Steel Co., at Buffalo.

Albert W. Marks, who has been master mechanic of the blast furnace department of the Pennsylvania Steel Co., at Steelton, Pa., and an employe for 19 years, has been appointed master mechanic of the entire plant, a new position that has been created.

H. M. Loftin, general manager of the Columbia Iron Works, Chattanooga, Tenn., has returned to that city from a business trip over the southern states. He says there is more business going than he had before realized and that everything points to a big business in all lines this year.

Frederick W. Cohen, engineer of construction, has resigned his position in the bridge shop of the Pennsylvania Steel Co., at Steelton, Pa., and will leave next month for New York, where he will engage in business. His resignation follows similar action taken some time ago by Ross R. Harrison, superintendent of inside shop work, who also will go to New York.

Reuben Bowen, district and department sales manager of the International Steam Pump Co., New York, for more than 15 years, and general sales manager of the Fred M. Prescott Steam Pump Co., Milwaukee, and the Jeansville Iron Works, Hazelton, Pa., has resigned to become general sales manager of the Epping-Carpenter Co., Pittsburgh, manufacturer of pumping machinery. This company is one of the oldest in the United States, its organization dating back more than 60 years. The company's new shops are modern in every respect, and the tool equipment is of the latest design for producing high grade direct acting and high duty crank and fly wheel pumping engines.

J. T. Georgeson, formerly connected with the machinery department of J. T. Ryerson & Son, Chicago, is now associated with the Vulcan Engineering Sales Co., 2014 Fisher building, Chicago, and has been placed in charge of the sales of the products of the Q. M. S. Co. New lines will shortly be added to this department, including punches, shears, air compressors and other equipment for structural plants, boiler shops and foundries.

F. A. Ogden, general freight agent of the Jones & Laughlin Steel Co., Pittsburgh, was presented a diamond pin when he resigned as president of the Traffic Club of that city. E. C. Sattley, of the Page Woven Wire Fence Co., Monessen, Pa., was elected chairman, and D. A. Aiken, traffic manager of Spang, Chalfant & Co., Inc., Pittsburgh, was elected second vice president of the club.

Captain Ernest H. McKinley, for a number of years master of transportation of the river coal interests out of Pittsburgh, has resigned his position with the Monongahela River Consolidated Coal & Coke Co., Pittsburgh, after 13 years of service, and has become the head of the river transportation department of the Pittsburgh Steel Co., that city, which is developing its river transportation on an extensive line.

W. L. Allison, of the Franklin Railway Supply Co., Detroit, has been appointed general sales manager of the American Arch Co., New York, with offices in Chicago. Mr. Allison will represent both companies in the future. F. T. Heffelfinger, of Minneapolis, has been elected vice president of the American Arch Co., to succeed C. B. Moore, who resigned to become vice president of the Jacobs-Shupert United States Fire Box Co., Coatesville, Pa.

George Westinghouse, of the Westinghouse Electric & Mfg. Co., was made the recipient of the Edison medal at a banquet at the Hotel Sommerset, Boston, recently, which represented the closing event of the convention of the Institute of Electrical Engineers. The prize, which was instituted by the associates of Thomas A. Edison, was awarded to Mr. Westinghouse for achievements in the development of the alternating current system of light and power. The award was the third made of the medal, the former recipients having been Elihu Thomson, in 1909, and Frank I. Sprague, in 1910. Mr. Thomson made the presentation address. When the Edison Medal Association was formed in 1904 a trust fund was subscribed to award the medal annually. It was intended to give it to college students, but in 1908, it was decided to award it each year to the person in this country or Canada performing the most meritorious achievement in electrical science.

David P. Hopkins, manager of the Addyston, O., plant of the United States Cast Iron Pipe & Foundry Co., has been promoted to assistant to President L. I. Lemoine, of that company, with headquarters in Philadelphia, and assumed his new duties on July 5. Mr. Hopkins has risen to his present position from practically the bottom. When the Addyston plant was built in 1888 by a company of stockholders, known then as the Addyston Pipe & Steel Co., he secured employment as a patternmaker, being at that time 21 years of age. After working at this trade for several years, he was promoted to foreman of the patternmaking shop, and a few years later he was also given the supervision of the draughting department. His exceptional ability was then recognized by the company, and he was appointed assistant superintendent, superintendent, and finally manager, in rapid succession, taking the last named position in 1901, which he has held up to the present time. When the plant was taken over by the present operators, he was retained in the same position that he held before the change was made. W. L. Perkins, manager of the Columbus, O., plant of the Pipe company, will succeed Mr. Hopkins, and John Fuller, son of the purchasing agent of the same company, will succeed Mr. Perkins.

MONUMENT DEDICATED

To Former President Martin Fox of Molders' Union.

The dedication and unveiling of the monument erected by the International Molders' Union of North America in memory of Martin Fox, president of that organization from 1890 to 1903, was held in Calvary cemetery, Walnut Hills, Cincinnati, on July 5, with appropriate ceremonies. Addresses were made by Samuel Gompers, president of the American Federation of Labor, Frank Morrison, secretary of that same organization, Joseph F. Valentine, president of the International Molders' Union of North America, who also unveiled the monument; John P. Frey, editor of the International Molders' Journal, Cincinnati; Lazard Kahn, of Hamilton, O., member of the Stove Founders' National Defense Association, and Rev. M. A. Hamburger, pastor of St. Mark's Catholic church.

Martin Fox was born in 1848 and died in Cincinnati in 1907, being 59 years of age. He was known as a great organizer and for his fairness and honesty in all of his dealings. During his term of office as president of the International Molders' Union of North America he formed an agreement between that organization and the Stove Founders' National Defense Association, which at that time were having serious labor disputes, whereby all troubles between employer and employe were to be settled by means of arbitration and conciliation. It was the first of its kind ever adopted, and has been in successful operation for over 22 years.

Address Made by Mr. Frey

Mr. Frey spoke as follows:

Fifty-three years ago today a small band of practical and determined men representing 14 molders' unions, met in Philadelphia, within a stone's throw from where the declaration of independence was written and almost within the shadow of the famous building where the signers of that greatest of all human documents consecrated their fortunes and their lives to the cause of human liberty. These sturdy mechanics also drafted a declaration of independence and before their labors had ceased, the International Molders' Union of North America had been organized for the purpose of guaranteeing industrial freedom and equality of rights for the molders of North America.

For 53 years, this organization has consistently endeavored to apply the principles on which it was founded and to a marked extent it has succeeded in establishing equality of rights between its members and their employers. It has improved the conditions of labor for its members, it has given them a broader grasp of their rights and their duties towards their fellow men, it has elevated their standard of living to a higher plane, and it has earned a widespread reputation for fair and honorable dealing.

There was a period in its history, however, when through errors in leadership, needless antagonisms had been created and a lack of confidence arose within its ranks. Its membership met with reverses and their number became reduced.

At this time a young man who was to become the central figure of the reconstruction period, began to make his qualities of leadership apparent. In 1886, Martin Fox, who had already given evidence of exceptional ability as a member of the board of trustees, was elected as secretary of our organization. It was then that he took up his life work which was to have so marked an influence in shaping the policy of our organization and placing it upon a firmer foundation than it had ever rested upon before.

FOX MEMORIAL

When he entered upon his duties, he found the organization without strong central authority, its ranks weakened, its resources almost exhausted and little left but strong sentiments of loyalty to its principles on the part of those who had been fighting its battles and who, like Napoleon's Old Guard, would surrender neither their principles nor their organization while life remained in them.

On the outside, the organization was assailed by powerful employers who believed that their best interests could only be advanced by destroying what remained of the organization. It was at this critical period that Martin Fox inspired the members of our organization with renewed confidence and began to build up and strengthen its depleted ranks.

As confidence increased and the organization grew in numbers through his devotion to its interests and his watchful care, another crisis arose, for the foundrymen in that branch of industry employing the largest number of our members at that time formed a powerful organization for the purpose of self-protection. Both organizations were called upon to prepare themselves for the struggle which seemed inevitable and when it came, both were better prepared to strive for mastery than they ever had been before.

From that contest and the lessons which it taught, there developed a better understanding of the industrial problems and of the rights of those who were affected by them. At first there seemed to be no possibility of harmony between those who had so recently grasped at each others' throats in the strife and stress of industrial conflict, but the abler minds in both organizations believed that industrial warfare was unnecessary and that a temporary advantage gained by either side did not result in permanent benefit or in that only form of peace which can exist between men conscious of their rights and determined to defend them.

Martin Fox was elected to the presidency of our organization in 1890, at a time when the strongest men on both sides were seeking a solution for the problems which had led to so much bitter strife in the stove industry.

It was then and during this early period of his administration as president that Martin Fox gave evidence of his sterling qualities and remarkable ability as a leader. The great international union which he assisted in building up and placing upon a stable foundation will forever remain a monument to his successful life's work, but in the industrial world his best known and most far-reaching achievement was the part he took in the consummation and gradual development of that greatest of industrial contracts, the conference agreements between the Stove Founders' National Defense Association and the International Molders' Union. It was the first industrial agreement between a national association of employers and trade-unionists to be entered into since our modern industries began, and it has since become the standard by which all similar industrial agreements between employers and organized labor have been measured.

When this agreement was entered into 22 years ago, there were many who looked upon it as a doubtful experiment doomed to failure and who would have been pleased to witness its destruction. There were many foundrymen who looked upon its provisions with antagonism and many trade-unionists who believed that it could not be of benefit to them.

It was during this period of uncertainty when the newer, saner and more just methods of dealing with the problems which arose in the industrial field were being applied, that Martin Fox gave evidence of that sterling integrity of character, those high qualities of heart and mind and that unyielding devotion to principles which marked him as an exceptional leader and one of the greatest characters developed by the labor movement in the western hemisphere.

His administration convinced the foundrymen that it was possible to preserve industrial peace, and the relationship between the two associations, one composed of foundrymen and the other

of union molders, became such that strikes and lock-outs were but a memory. Confidence replaced suspicion, and the methods of conciliation, regulated by mutually adopted rules, replaced the former resort to brute force in adjusting the points of difference which arose. A firm believer in conciliation and the spirit of arbitration, Martin Fox avoided recourse to strikes in the other branches of the foundry industry with all of his influence, but when peaceful measures failed, no one was more determined to fight the issue to a finish. While success did not always follow the molders' efforts to improve their condition, he never accepted discreditable peace, preferring, instead, temporary defeat.

Upon the granite before us which marks the hallowed spot where those who loved and honored him returned his body to Mother Earth, there is engraved a statement from one of his official reports which testifies to his high ideals and straightforward purpose as a trade-union leader. The words are these, "It has been my purpose to give the Molders' Union of North America and its officers a reputation for honesty and fair dealing in the business world, and even though it might temporarily advantage our interests, I have consistently refused to do aught that would savor of bad faith or double dealing."

Throughout the period of his administration, he labored to give our organization a reputation which would win the respect and confidence of those with whom it came in contact. By his example and counsel he taught our members to respect and obey their laws and impressed upon them the necessity of honoring the provisions of all agreements entered into with employers. In these efforts he was eminently successful and his administration was marked by splendid discipline on the members' part and by a continually growing respect among foundrymen for the value and desirability of agreements with the molders' union.

In heart and mind, Martin Fox combined some of those rare qualities which make men true leaders of their fellow men. He inspired his associates by his example and his unselfish devotion to the cause to which he gave the best years of his life and the talents with which his maker had endowed him. Modest and unassuming in character, never seeking the positions of honor and responsibility which were placed upon him by those he represented, kindly in spirit and bearing no resentment towards those who attacked his policies, placing loyalty to principle above all else, he was one of those characters who inspired his fellow men with a desire to strive for the right for the right's sake.

Among the employers of labor he had earned a well merited reputation for honesty of purpose, steadfastness to principles, clearness of vision and integrity of character. Through his personality, he won the confidence and good will of many foundrymen who found that through industrial agreements with the molders' union they could secure the most satisfactory method of adjusting those questions which continually arise between employers and employes.

In the American trade-union movement, he was known as a fearless champion of human rights and industrial justice and one of the foremost advocates of the methods of conciliation and the spirit of arbitration for the solution and adjustment of industrial disputes.

To the members of the International Molders Union he was a trusted leader with a genuine interest in each member's welfare. To improve their conditions of labor and elevate their standard of living, he gave the loyal devotion of heart and mind for the best years of his life, and when health failed under the strain of long-continued labor, and he was no longer able to bear the heavy burden of responsibility, the members of our organization made generous provisions for his declining years.

In the official family of the International Molders' Union, his kindly spirit and thoughtfulness for others won the deepest and most sincere sentiments of respect and friendship and at all times he enjoyed their loyal support.

The tribute which we pay today but faintly expresses our respect for

MARTIN FOX

his memory and our appreciation for his great services to our organization and the trade-union movement. By his devotion to the cause of industrial justice and his masterful application of the principles of conciliation and arbitration to the adjustment of industrial disputes, through his integrity of character and his achievements as a leader of men, he gave the world a striking example of the measureless benefits which flow from the lives of those who devote their energies and talents to the uplifting of the masses who earn their bread by the sweat of their brow. He was a fearless champion of industrial democracy. He elevated himself by elevating his fellowmen.

The Thacker Coal & Coke Co., Cincinnati, with chief works in West Virginia, has increased its capital from $600,000 to $1,000,000.

STEEL PLANTS

Will be Built by Rothert Steel & Iron Co.

The Rothert Steel & Iron Co., First National Bank building, Denver, Colo., which was recently incorporated, advises that it intends building a steel plant in Colorado and one in New York state. The capacity of the plants has not been decided upon, but the eastern plant, because of the greater market in this country and Europe, will be much the larger. The company was incorporated with a capital of $5,000,000 to manufacture steel from magnetic titaniferous iron ore by a process discovered by E. H. Rothert. The officers of the company are: President, E. H. Rothert; D. E. Rowe, vice president and secretary; R. H. Tatlow Jr., treasurer. The three officers comprise the board of directors.

Pyrite Production Increases

The production of pyrite in the United States in 1911 amounted to 299,904 long tons, valued at $1,162,261, an increase of 58,292 long tons in quantity and of $184,283 in value compared with 1910. These figures are the maximum ever recorded by the United States Geological Survey for the pyrite industry. Though low-grade sulphide ores of copper containing considerable quantities of pyrite and pyrrhotite and zinc-sulphide concentrates have been used in recent years in the manufacture of sulphuric acid, the output of pyrite has shown a great increase during the last five years which has been a time of rapid development of the by-product sulphuric acid industry.

Again Operating. — The Dalton Foundry, Warsaw, Ind., recently damaged by fire, is again operating in full. Within a few days after the fire the loss of core boxes and patterns was accurately ascertained and all of the company's customers were notified to replace core boxes and patterns at the Dalton Foundry company's expense.

President W. C. Brown, of the New York Central lines, announces the loaded car movements on the system for the month of June as 1,762,783 against 1,687,552 last year, an increase of 75,201 cars. These were the heaviest of any June on record, exceeding by 12,000 cars the heaviest previous loaded movements for that month, which was in June, 1910.

Tremendous Tonnages of Low Grade Iron Ores

Will Be Used in Future Years—Concentration Will Be a Method of Increasing Importance—Plenty of High Grade Ore Still Available

Republic, Mich., July 9.—Ever since the development of the first mines more than six decades ago consumers of Lake Superior iron ores have, as a general proposition, been demanding the best qualities of the mineral. This tendency has not been so prominent of late years, since the need of conservation has become more generally realized, nevertheless great holes continue to be made in the deposits of the material of better grade. It is only a question of time when the cream will have all been skimmed.

The demand for the Lake Superior product has been increasing at a rapid rate the last two decades, each five-year period showing a remarkable gain, and whereas the outgo the present season is on a 45,000,000-ton basis, the time when 75,000,000 tons—even 100,000,000—will be needed annually does not appear to be a great many years distant, especially as since the average of the iron contents is certain to decrease the volume of the output is bound to attain larger proportions. Except in the case of a few properties whose product is desired for use as an admixture in furnace stacks, and except in cases where it is advisable to extract the mineral as it is reached in the ground, there has been little mining of ores of inferior grade. Eventually, the deposits of the latter class will have to be drawn upon heavily.

There is no possibility that the Lake Superior region will not supply the bulk of the iron ores needed by American consumers for many years. Mining even at the rate of a hundred million tons per annum—if that be possible—it would take a generation to exhaust the "available" ores, estimated by the United States geological survey at 3,500,000,000 tons. There are, in addition, 72,000,000,000 tons of ore not available at present, but which some time, through mechanical and metallurgical means, are certain to be put to commercial use.

Great Michigan Deposits

Of ores containing 3 to 40 per cent metallic iron, it is estimated that the Marquette range alone holds sixteen billion tons. Concentration will make some of these available, as will revolutionary furnace processes, such as that designed by John T. Jones, of Iron Mountain. The bulk of the Marquette range low grade ores is in the Cascade field. A few years ago, when the Cascade corporation, in which a number of Michigan and Minnesota lumbermen are interested, tested a portion of its lands with the diamond drill, no less than ninety million tons of ore of the class produced at the Steel Corporation's Moore mine were located. The same interests are at work in the Cascade field again. Some Bessemer ore had been encountered at a depth of 600 feet in one of the holes put down on the first occasion and it is chiefly to determine the possibilities of this discovery that the present operations are in progress.

Until a pocket of Bessemer material was found in the old Platt mine years ago, it was thought that only a silicious ore of low grade would ever be produced in the Cascade district. Only one Bessemer property—the Volunteer, at Palmer lake—has, indeed, ever been opened in the field, and this one, which still is classed as an exploration, also has ore of non-Bessemer quality. The Volunteer deposit was located by diamond drilling three years ago. A shaft has since been sunk and several levels opened and the property has been given an excellent equipment.

The Volunteer Idle

The Volunteer is not in commission at present, however, operations having been suspended a few weeks ago because of the low price of ore. One hundred and eighty men were employed. The company has 75,000 tons of ore in stock and it declines to sell except at prices netting a fair profit. The Steel Corporation's Moore mine likewise is idle, as is Oglebay, Norton & Co.'s Empire property, the latter temporarily. M. A. Hanna & Co.'s Richmond mine is at work producing steadily. The Moore and Richmond are open-cut properties, mined with the steam shovel, after the ore has been blasted from the sides. The Empire is wrought on the milling system. The Heidelback interests, of New York, owners of a large acreage in the Cascade country, are exploring 3 miles east of Palmer lake. Diamond drilling is the method employed.

A very large proportion of the great bodies of low grade silicious ores which the Cascade is known to contain lies close to the surface, the formation outcropping at many places, and most of the deposits can be mined very cheaply. Exploration at depth has so far been comparatively meager and it is by no means impossible that eventually important tonnages of Bessemer will be located. Much money was wasted in gopher-like exploration in the old days. Test pits and shallow shafts are to be seen everywhere. Now that it is known that if Bessemer deposits exist—or non-Bessemer of better than the silicious grade, as at the Volunteer—they lie well beneath the surface, it is at least assured that future exploration will be conducted more intelligently.

The American Mine

Tremendous tonnage of low-grade ores which, like those of the Cascade, some day will be used in making iron, exist in various Marquette range fields all the way from Ishpeming to the westerly limits of the region. The first of these will go to furnaces next spring. They will come from M. A. Hanna & Co.'s American mine. This product as it lies in the ground is practically worthless. Treated by a washing process somewhat as are the sandy ores of the western Mesabi, however, and with much of the waste material eliminated, the mineral is brought up to merchantable grade. This will be done at the American mine. A concentrating plant is to be erected for the purpose.

Mining the low grade stuff at the American—800 feet below the surface—will be only incidental to the production of the shipping ore taken out at present. With the conditions otherwise, indeed, it would not pay to take it out. The American produces a hard ore of excellent quality. The low grade material is a hematite, the strike of which is parallel to the hard ore lenses. Each class can be mined in conjunction with the other. The concentrating material must, indeed, be won at this time; it would be unprofitable to go back

after it or to attempt its recovery in later years, with the present workings abandoned.

Directly west of the American holdings are tracts which George J. Maas, of Negaunee, and associates have tested with diamond drills. While much high grade ore was found, an enormous deposit of low grade material was located. It is, in fact, estimated by Mr. Maas at upwards of a quarter of a billion tons. This deposit does not lie particularly deep and it is the belief that its ores can be won and concentrated profitably. A project of the kind even now is in mind.

A high-grade concentrate not only is procured as a result of the washing process, but generally considerable of the phosphorus is eliminated, as is some of the moisture. However, it probably will be many years before the immense low grade deposits of the Lake Superior country are attacked in earnest. Concentration will be employed in scattered instances, but the present policy of taking the best of the available ores doubtless will be adhered to until necessity impels a resort to the mineral of less iron content.

Order Rate Reduction

Washington, July 9.—Following its decision in the Boileau lake cargo coal rate complaint, the Interstate Commerce Commission has ordered a 10-cent reduction in the rate from the Pittsburgh vein No. 8 field to Cleveland and Huron, O., making the rate 75 cents per net ton. The facts and considerations that controlled in the Boileau case caused the commission to reach the decision with regard to the complaints of the Pittsburgh Vein Operators' Association against the Pennsylvania railroad and the same association against the Wheeling & Lake Erie and other carriers involved in the movement.

Inasmuch as the 75-cent rate was put into effect on May 1, the day the 88-cent lake cargo rate involved in the Boileau case was reduced to 78 cents, the order of the commission today became effective forthwith and was merely a quasi-judicial approval of an adjustment forced by the decision in the earlier case.

Other Lehigh valley blast furnaces have followed the recent action of the Empire Steel & Iron Co., Catasauqua, Pa., and the Thomas Iron Co., Easton, Pa., in advancing wages 10 per cent. The Carbon Iron & Steel Co., Perryville, Pa., put into effect, July 1, a raise in the scale of this proportion. The advance in wages to eastern furnace workers, necessitated by the universal demand for common labor, further shaves the already meager profits of ironmakers at present prices.

NEW STEEL COMPANY

Awards Contract for Plant Construction at Warren, O.

The Trumbull Steel Co., recently incorporated with a capital of $1,000,000, has awarded the contract for the construction of its buildings in Warren, O., to the Riter-Conley Mfg. Co., Pittsburgh. About 1,400 tons of structural steel will be used. The main building will be 80 feet wide and over 1,000 feet long, while the tin house will be 70 x 500 feet. In addition to these buildings the boiler house and one or two others will be erected. The work of construction will begin about Oct. 1. The company will engage in the manufacture of tin plate.

Sell Multistage Compressors

Within the last month the General Electric Co., Schenectady, N. Y., has received the following orders for multistage centrifugal air compressors for service as blast furnace blowers: one 25,000 cubic feet per minute, 15 to 25 pounds pressure, compressor driven by a high-pressure steam turbine, from the E. & G. Brooke Iron Co., Birdsboro, Pa.; one 13,000 cubic feet per minute, 16 to 25 pounds pressure, compressor driven by a mixed pressure turbine, from the Chattanooga Coal & Iron Co., Chattanooga, Tenn.; three 40,000 cubic feet per minute, 15 to 30 pounds pressure, compressors driven by high pressure steam turbines, from the Woodward Iron Co., Woodward, Ala.

The General Electric Co. has six multistage air compressors already installed as blast furnace blowers. Arguments advanced in favor of this type are the saving of floor space, net weight, oil supplies and maintenance and the control of the required volume and air against whatever pressure may be required. This close control of air is accomplished by a constant volume governor which is one of the features of these blowing engines.

The Eastern Moline Plow Co., Bloomington, Ill., advises that the report about its contemplating the erection of a new building is entirely eroneous.

OBITUARIES

Samuel E. Light, for many years a very prominent figure in the iron industry in Reading, Pa., has died unexpectedly in Tulsa, Okla. He is survived by a widow and several children, all of whom live in Pennsylvania.

C. Perry Edwards, construction superintendent of the Carnegie steel mills at Youngstown, O., died recently of heart failure at that city. He was born in Almond, Allegheny county, Pa., April 3, 1850, and worked as a puddler in a mill at Youngstown when 17. He had been with the Carnegie company and its predecessors 45 years.

William A. Hardy, president of the William A. Hardy & Sons Co., Fitchburg, Mass., and one of the pioneer foundry men of New England, died July 4, of heart disease. He was 75 years old. He first became connected with the brass foundry trade in 1854, and, after learning the molder's trade at the Charlestown navy yards, took over the business of which he became the head in 1861. Besides a widow, six sons survive. Mr. Hardy was a veteran of the civil war, and belonged to a number of lodges.

William Henry Bleckly, justice of the peace of Thelwall Lea, Warrington, died a few days ago at Colwyn Bay, aged 72. For many years he was treasurer of the Iron and Steel Institute, vice president and trustee of the Bessemer medal fund, founder of Bewsey forge, and subsequently of the Pearson & Knowles Iron Co. He was a director of Partington Steel Works, now being built, and of the Manchester ship canal. The Warrington works employ 2,000 hands.

Cecil Brunswick Smith, head of the engineering firm of Smith, Kerry & Chase, Toronto, widely known in connection with hydro-electric and railroad engineering enterprises, died recently, at Toronto, aged 48 years. He was the first chairman of the Temiskaming & New Ontario railway commission and engineer in charge of the Ontario hydro-electric system for some years. Among other power enterprises in which he was engaged were the Canadian Niagara Power Co., the Lac Du Bonnet system, of Winnipeg, the Calgary Power Co., the Mount Hood Railway & Power Co., of Portland, Ore., and the Crane Falls Power & Irrigation Co., of Idaho. Mr. Smith was at one time president of the Canadian Society of Civil Engineers, and was the author of some text books on railway engineering.

ATLAS ENGINE WORKS

Placed in Receiver's Hands—New Indiana Concerns.

Indianapolis, July 9.—The Atlas Engine Works, one of the largest engine builders in the country, has gone into the hands of a receiver, on application made to the superior court by Frank H. Wheeler and George M. Schebler, creditors in the sum of $2,387.50. Fred C. Gardner, treasurer of E. C. Atkins & Co., has been named receiver for the Atlas company and has qualified by giving $50,000 bond. The present difficulty was brought about by one of the company's largest customers asking for an indefinite suspension of deliveries on contracts and the fact that the same customer has temporarily suspended payments. The creditor mentioned is indebted to the Atlas company about $100,000.

There have recently been conducted at the shops of the Indianapolis Union Railway Co. some very interesting and successful experiments in using Prest-O-Lite gas to weld the broken frames of locomotives. The experiments have been conducted by the Capital City Welding Co.

I. W. Clark, of Greentown, has taken up with the Commercial Club of Tipton, Ind., a proposition to establish a foundry employing 20 men in Tipton. Clark proposes to make machinery repairs as well as to manufacture castings.

Machinery and supplies will be handled by the newly organized Miko Machinery Co., at Muncie, Ind., which has been incorporated with an authorized capitalization of $1,000. Those interested in the company are C. D. Fischer, J. M. Heron and O. B. Bannister.

Charles H. Martin, inventor and patentee of the Martin tractor, is arranging to establish a factory in this city for the manufacture of his device, which converts any horse-drawn vehicle into a motor-driven vehicle. He has organized the Martin Tractor Co., which has been incorporated with an authorized capitalization of $350,000. Those interested in the company with him are Hugh R. Richards, president and general manager of the Noelke-Richards Iron Works; Frank B. Davenport, general agent Penn Mutual Life Insurance Co.; George D. Thornton, secretary-treasurer Puritan Bed Springs Co., and Edward D. Moon.

A general machine and repair business will be conducted by the Curpatca Machine Co., which has been organized at Mishawaka by L. J. Patterson, A. O. Curtis and R. C. Catton. The company has been incorporated with an authorized capitalization of $15,000.

FALL MEETING

Of Iron and Steel Institute to be Held in Leeds.

Announcement is made by the Iron and Steel Institute, from its offices at 28 Victoria street, London S. W., that the autumn meeting will be held at Leeds on Sept. 30 to Oct. 4. Members upon their arrival at Leeds on Sept. 30 will register at the secretary's office at the hall of the Philosophical and Literary Society, Park Row. The address of welcome will be given by the lord mayor of Leeds, William Nicholson, on Tuesday morning, and thereafter regular sessions with the presentation of formal papers will be held. A number of social affairs, including visits, etc., have been arranged for members and their wives, and on the afternoon of Thursday, Oct. 3, they will be guests of Lord and Lady Airedale at a garden party at Gledhow Hall.

Hold Up Bond Sale

The sale of the Alabama Consolidated Coal & Iron Co. bonds by the Baltimore Trust Co., has been held up for at least six weeks, upon presentations made by the receivers and others interested in the welfare of the company, according to Henry W. Coffin, one of the receivers. The Baltimore Trust Co. will await the outcome of the receivers' work, it is said, before taking any action.

The stockholders' committee of the Consolidated company sent circular letters to the holders of the preferred shares requesting permission to act for them. The letter says in part:

"In view of the conflict on the receivership appointed for the Alabama Consolidated Coal & Iron Co., we think it exceedingly desirable that all preferred stockholders act in common for the protection of their interests, and as this committee represents a majority of the total outstanding preferred stock, we urge that you give us authority to act on behalf of the shares of preferred stock owned by you."

The Ames Iron Works, Oswego, N. Y., through the George T. Laid Co., engineers, Pittsburgh, has sold to the American Sheet & Tin Plate Co., Pittsburgh, three 150-horsepower horizontal tubular boilers for installation in the Pittsburgh mill.

ORE SHIPMENTS

In June Make New High Monthly Record.

Ore shipments during June were 7,567,555 gross tons, which is an increase of 2,747,559 gross tons over June, 1911, and also an increase of 250,963 tons over the movement of June, 1910, which was the record movement for an early month. Shipments to July 1, 1912, total 13,690,671 tons, which is only 1,227,587 tons less than the movement to July 1, 1910, when the record movement for the year was made. It is the expectation that the 1910 movement will be rapidly overtaken and the year 1912, notwithstanding the fact that it is a presidential year, will be a record-breaker. Shipments by ports were as follows:

Port.	June, 1911.	June, 1912.
Escanaba	538,168	849,059
Marquette	314,807	561,976
Ashland	394,555	811,029
Superior	1,629,112*	2,348,608
Duluth	1,102,979	1,551,214
Two Harbors	840,345	1,445,669
Total	4,819,996*	7,567,555
1912 increase		2,747,559

Port.	To July 1, 1911.	To July 1, 1912.
Escanaba	1,067,708	1,641,948
Marquette	533,738	918,890
Ashland	662,412	1,332,801
Superior	2,944,954*	4,344,331
Duluth	2,053,134	2,845,478
Two Harbors	1,577,426	2,607,223
Total	8,836,372*	13,690,671
1912 increase		4,854,299

*Corrected.

Installs Open Hearth Furnace

The S. Jarvis Adams Co., Pittsburgh, has installed a 20-ton open-hearth furnace in its plant at Midland, Pa., and steel castings, as well as gray iron castings will constitute the output of these works in the future. Changes have been made in the organization recently and the officers are as follows: J. Ramsey-Speer, president; Joseph McK. Speer, vice president; Charles McKnight, treasurer; Clyde Brooks, secretary; F. B. Foster, manager of sales, and W. L. Forster, general superintendent.

Stock Converter.—The Otis Steel Co., Cleveland, has secured the territorial license for northern Ohio for handling the Stock oil-fired converter. The contract calls for a two-ton plant. The process permits the direct charging of raw material into the converter, where it is melted with an oil flame and refined by blowing. Eighteen British firms have adopted the process for light work. Charles S. Powell, 165 Broadway, New York, is the American agent.

RATE DECISION

In Case of Flour City Steamship Co. of Great Importance.

If the Interstate Commerce Commission's decision in the complaint of the Flour City Steamship Co. and the Minneapolis Traffic Association runs the gauntlet of the courts, the lake shipping business will be thrown wide open to every man who has money enough to secure a boat and is willing to take the chance of getting package freight. The decision is a blow below the water line for the so-called standard lines owned or controlled by the eastern trunk railroad lines.

The understanding at Washington is that the Flour City company is preparing a tariff for westbound movement of package freight. That tariff will carry proportional and port-to-port rates. That is, it will publish rates at which it will carry freight as part of a through movement and rates on business originating locally at Buffalo and bound up to the head of the lakes.

One of the Pennsylvania railroad company's tariffs is the loop-hole through which the commission pushed the Flour City line of steamers and got them around what seemed like an insurmountable obstacle. In that tariff the Pennsylvania offers to switch traffic from the Union docks to the terminals of any common carrier at Buffalo at an arbitrary price of $2.10 per car. The law says that no "through" route may be established in which is included anything less than substantially the whole line of the carrier between the termini of the proposed "through" route.

But for the Pennsylvania's tariff before referred to, that provision of the law would have forbidden the order requiring the Lehigh and Lackawanna railroads' tariffs to become part of through routes composed of the Minneapolis lines and the Flour City steamers, because neither the Lehigh nor the Lackawanna has tracks to the Union docks where the Flour City line steamers propose to unload their cargo. But inasmuch as the Pennsylvania held itself out as being willing to carry goods from the Union docks to the terminal of any other common carrier at Buffalo, the commission said the company could not at this time avail itself of the immunity granted by the section of the statute forbidding the inclusion, in a "through" route, of anything less than substantially the whole line of a carrier between the termini of a proposed "through" route.

Commissioner McChord, who wrote the opinion of the commission, ignored the assumption on which the Pennsylvania obviously acted when it published that switching tariff. That assumption was that no common carrier would break into Buffalo and demand to be served. The commission, holding the Flour City line to be a common carrier, ipso facto, made that tariff applicable to flour or any other commodity brought to Buffalo by the Flour City steamers.

It might be suggested that the Pennsylvania can close the hole by withdrawing the tariff. That is easily suggested but inasmuch as there can be no tariffs of any kind filed without the consent of the commission and since the cancellation of that tariff would leave the public to pay whatever charges a horse transfer company might deem proper to impose, any attempt to cancel the tariff would probably be stopped by an order suspending the cancellation tariff and a direction to the company to show why it so desired to increase rates the public would have to pay for the transfer of freight from the Flour City lines to the Lackawanna and Lehigh.

Canadian Imports Increase

Canada's imports of iron and steel from the United States for the fiscal year ended March 31 last, totaled $36,382,725, as against $29,307,039 for the previous year. This total does not include machinery, agricultural implements nor many other articles properly classified as iron and steel. The gain in imports from the United States the last fiscal year in the foregoing items of iron and steel was $7,075,686 or more than 27 per cent. The first three months of the current fiscal year ended June 30, and the figures on hand at the government departments show a steady increase with every indication in all the industries using iron and steel, that last year's iron and steel imports will be much greater than the previous year, which broke all records.

Receives Foreign Contracts.—The Union Iron Works, a subsidiary of the Bethlehem Steel Corporation, has been awarded the contract by Mexican government for a new Pacific coast light house tender. The Bethlehem Steel Corporation has also recently received orders for coast fortifications and naval armament for the countries of Chili and Argentina.

CHARTERS ASKED

By Six Pennsylvanian Power Companies.

Pittsburgh, July 9. — Charters are being applied for by the Cambria Light, Heat & Power Co., the Carr Light, Heat & Power Co., the Chest Creek Light, Heat & Power Co., the Moss Creek Light, Heat & Power Co., the Red Top Light, Heat & Power Co., and the Sterling Light, Heat & Power Co. by interests identified with the Penn Central Light & Power Co., of Johnstown, Pa.

It is stated that these six companies are to be operated throughout Cambria county and central Pennsylvania and propose erecting extensive power houses and constructing distributing lines throughout the coal mining section where they will supply power for operating mining plants, town lighting plants and industrial plants. The charter rights are considered important, and if the improvements are carried out as planned there will mean important machinery orders in the near future.

New Bethlehem Branch Line

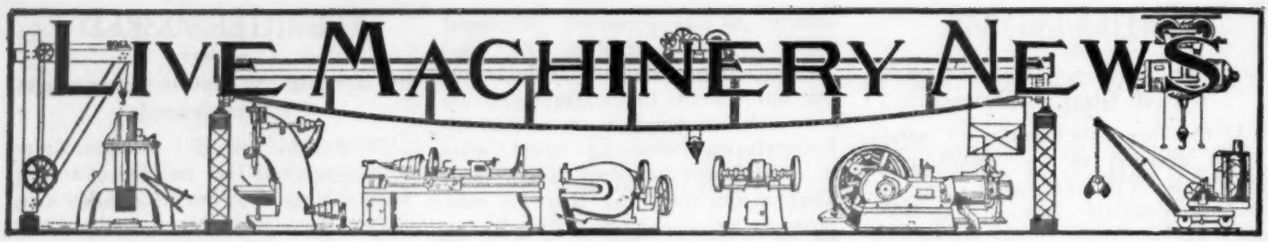
The Pennsylvania railroad is planning the construction of a branch line from Lancaster, Pa., to South Bethlehem, Pa., in order to reach the industries of the latter point, especially the plant of the Bethlehem Steel Co. The new by-product coke plant being erected for the steel company at South Bethlehem, will be one of the objective points of the new line. The extension will be a spur from the main line of the Pennsylvania railroad at Lancaster, and will traverse Berks, Bucks, Northampton, Lehigh and Schuylkill counties.

Relight Woodward Furnace

No. 2 furnace at Woodward, Ala., owned by the Woodward Iron Co., which has been overhauled and relined, was blown in last week, and No. 1 furnace has been blown out. Furnaces No. 2 and No. 3 will work steadily until the new No. 1 is constructed. The demolishing of furnace No. 1 will be done at once and the vacant ground cleared away for the foundation of the new stack that will give a new 400-ton furnace of the latest variety. The new stack will have in it every improvement known to modern furnaces.

The Locomobile Co. of America, Bridgeport, Conn., has increased its capital from $5,000,000 to $6,500,000.

LIVE MACHINERY NEWS



In New York developments during the first part of the month in the machinery field have been very satisfactory and it is expected that July's volume of business will eclipse that of June by a considerable margin. The activity is centered mainly in lathes, milling, planing and shaping machines. In hoisting engines and other lines of contractors' equipment, demand has fallen off, while a lapse of activity is also reported in cranes. The Boston & Maine Railroad has not yet issued the expected list of machine tool specifications in connection with the Reedville shops of that road. From St. Louis and Chicago, it is reported that the trade is sending in bids on a list just submitted by the Missouri Pacific Railroad. The list calls for a number of various machines which have an approximate total volume of $30,000.

In Pittsburgh average reports of machinery manufacturers indicate a 15 to 20 per cent increase in business, with the volume of inquiries increasing at an even greater rate, which leads to the general opinion that within another month shop capacity will be fairly well filled. The amount of new business that is coming out is of the best character. The steady improvement of the iron and steel industry is showing somewhat definitely in the way of new mill construction and equipment orders. The general run of trade in small business is very satisfactory and of a larger volume in the aggregate than at any time for many months past. The improvement has affected prices, and while they are still low, they are better than have prevailed for a long period. There are several important contracts to be closed within the next ten days, which Pittsburgh dealers are bidding upon at this time. New plants at Morgantown, W. Va.; Massillon and Warren, O.; and improvements at Homestead, Braddock and Monessen, Pa., figure in the new line of activity.

In Cleveland, orders for machine tools fell off to a small extent during the last week, and the market is not so satisfactory as it was several weeks ago. Although orders for single tools have come in at a fairly good rate, they are not so numerous as they were in June. No inquiries are out just at present, but a couple of good ones are expected within a few weeks. One of the supply houses, which bought out a local manufacturing concern a few weeks ago, reports that the sale of second hand machinery continues to be heavy.

Power Plant Equipment

The Jeannette Glass Co., Jeannette, Pa., is taking bids on a steam driven electric power plant for its works.

A power plant is being installed at Holt, Ala., for the Central Foundry Co. The electrical machinery is all on the ground and the work will be finished in the course of a few days.

C. C. Davis, Brookport, Ill., intends to purchase power and conveying machinery for the grain elevator which he is erecting. Work on the building has already begun.

Sawmill and power equipment is wanted by the American Metallic Packing Co., Lexington, Ky.; second-hand equipment will be given the preference.

The Allyn Engineering Co., Cincinnati, is receiving estimates in that city and also in Dayton, O., for a power plant and equipment for the Noyes Mfg. Co., of Dayton.

Construction work is ready to begin on the plant of the Dix River Power Co., Richmond, Ky. L. B. Herrington, president of the Richmond Lighting Co., heads the new company.

Improvements will be made in its plant by the Clinton Water & Light Co., Clinton, Ky., which was recently incorporated with $15,000 capital stock by P. H. Porter, Thomas Emerson and others.

The Steel Heddle Mfg. Co., Philadelphia, advises that it is erecting a building, 60 x 100 feet, and a power plant of 500 horsepower with Hamilton-Corliss engine and Crocker-Wheeler generator will be installed. All contracts for machinery and boilers in the new power plant have been placed.

The Midland Coal & Coke Co., Philippi, W. Va., which has recently taken over the Tygarts River Coal Co., at Arden, W. Va., is preparing plans for a central power station for operating all the lines of the company as well as other lines along the Tygart valley. The company's engineers have now the plans under way.

The Hartford Rubber Works, Hartford, Conn., is to erect a concrete addition, 100 x 50 feet, to its power plant. It will increase its boiler capacity by 3,000 horsepower, and install an automatic coal-feeding system. Motive power is to be increased by a mixed low-pressure turbine of 800 kilowatt capacity, and the electric generating power will be increased.

Machine Tools

The Clark Motor Car Co., Louisville, Ky., will require a considerable complement of machine tools for installation in its new repair shop, now under construction. The company has doubled its capitalization.

The De La Vergne Machine Co., New York, has entered the market for some engine lathes and milling machines of various sizes. It is expected that these will be closed for within a week or two.

The new Gilbert & Barker plant, West Springfield, Mass., was formally dedicated last week. The plant includes 11 buildings, and has a floor space of more than two acres. Machinery in the company's old plant in Springfield is being removed to the new buildings, and some new machinery, including several welding machines, will be purchased.

The United States Steel Corporation is making appropriations of considerable size at the present time for the purchasing of machine tools and other mechanical equipment for its various plants. A number of the different subsidiaries are participating in these purchases, but the largest buying has been done for the Carnegie

Steel Co. and the plant of the American Steel & Wire Co., in the Birmingham district. The aggregate of these purchases will reach several hundred thousand dollars.

Water Works

Bids have been filed with the municipal authorities of Homestead, Pa., for a new high-pressure waterworks equipment for boosting and supplying the new municipal reservoir. The contract is expected to be awarded within a few days and calls for a pump working against a mean head of 90 feet with 350 gallons per minute, to be direct-connected with a three-phase motor.

New Construction

The Strong Steel Foundry Co., 27 Morris street, Buffalo, will build a one-story brick office costing $10,000.

The Clinton Wire Cloth Co., Clinton, Mass., is having plans prepared for the erection of an addition to its plant on Woodland street.

Rochelle, Ill., manufacturers are said to be contemplating the erection at Forreston, Ill., of a factory for building gasoline engines.

The Stover Engine Works, Freeport, Ill., advises that it is erecting a fireproof concrete building, 80 x 200 feet, three stories high. The contract has been placed.

The Whitney Mfg. Co., 7 Vine street, is to erect a two-story brick factory on North avenue, Worcester, Mass. The building will be 70 x 200 feet, with flat roof of tarred gravel.

The Warwood Tool Co., Wheeling, W. Va., advises that it has erected a small extension to its warehouse, having dimensions of 32 x 64 feet. The company is not in the market for any new equipment.

The American Radiator Co., 1741 Elmwood, Buffalo, has filed plans with the bureau of building for a brick and steel shop to cost $2,300, a brick and steel carpenter shop to cost $9,000, and a foundry and cupola building to cost $22,000.

Two new buildings have been started by the Canton Steel Foundries Co., Canton, O., to house molding and open-hearth departments. The American Bridge Co., New York, has the structural work, which is estimated to cost $100,000.

The Pittsburgh Bridge & Iron Works, Pittsburgh, has been awarded a contract for a machine shop at Cleveland, for the Pennsylvania lines west. Contracts are to be awarded this week for an eight-story warehouse in the Point district of Pittsburgh, which will face the elevated tracks of the Pennsylvania railroad. The building will contain power plant and complete elevator system.

The Thomas Furnace Co., Milwaukee, Wis., advises that it is building a small machine shop and blacksmith shop for furnace repairs. The company is not in the market for any new equipment. It is moving the equipment which it has in its old shops to the new plant.

The Yale & Towne Mfg. Co., Stamford, Conn., advises that the construction work it has under way is a small extension to one of its manufacturing buildings. No additional equipment will be required as the building will mean only a slight enlargement of a few rooms.

The Wyman & Gordon Co., Worcester, Mass., manufacturer of forgings, is having plans prepared for a large addition to its plant. The building will be of brick, three stories, and additional machinery will be required. Definite plans and requirements have not been announced.

The Howard Iron Works, Buffalo, advises that it has let the contract for an addition to the machine shop. The addition will be of steel and brick construction and will be 55 x 200 feet. The corporation manufactures vises, fire hydrants, bolt, nut and power transmission machinery.

The Lewis & Clark Steel Co., Tacoma, Wash., advises that plans have been prepared and specifications made with estimates calling for the expenditure of $7,500,000 to equip its plant on a commercial basis. There is also provided $2,500,000 as operating capital.

The Hunkin-Conkey Construction Co., Cleveland, has been awarded a contract for a three-story brick and mill constructed factory building, 40 x 145 feet, for the Interstate Foundry Co., Cleveland. The building will be erected on East Sixty-first street, near the Erie railroad.

The Wheeling Mold & Foundry Co., Wheeling, W. Va., is considering plans for enlarging its Peninsula plant at that city for the manufacture of engines and for building a crane runway and new office building. The company has recently purchased additional ground adjoining its present works.

The Worcester Machine Screw Co., Worcester, Mass., advises that it is erecting an addition to its factory. Its dimensions are approximately 52 x 150 feet, and it will be three stories, and used entirely for manufacturing purposes. The company will not at present install very much new machinery, although a few additional units will be put in. The building is being erected to give better service to the company, which has been congested for some time. It expects to occupy the building some time between Aug. 1 and 15.

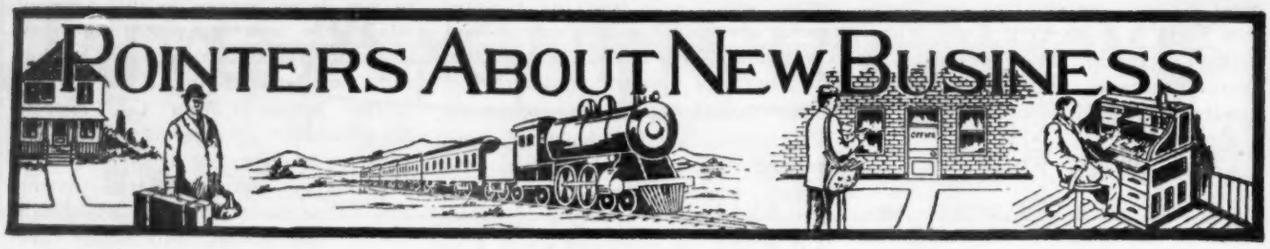
The Arthur Colton Co., Detroit, manufacturer of pharmaceutical machinery, advises that it is erecting a new factory, corner Jefferson avenue and Chene street. It will be of concrete construction, thoroughly fireproof, and will have over 30,000 square feet of floor space. Just what machinery will be required is not known by the company as yet.

The estate of P. D. Beckwith, Inc., Dowagiac, Mich., advises that the building being erected at its factory is to replace a portion of the old factory. The new building will be of reinforced concrete construction, practically fireproof, 175 x 250 feet, two stories, and will be used for a mounting room for the corporation's Oak stoves and base burners. No machinery will be required, as the equipment in the old buildings will take care of the wants of the new plant. During the last five years the corporation has rebuilt all the old portion of its factory except the new part now being rebuilt. In addition to this rebuilding, the capacity has been greatly enlarged from time to time during the past few years.

The Minneapolis Threshing Machine Co., Hopkins, Minn., manufacturer of engines, farm motors, threshers and cornshellers, advises that it has now under construction a new office building, 56 x 160 feet, two stories and full basement, with a wing 32 x 36 feet, for a vault two stories and full basement. Located in the rear of the office will be an exhibition building, 56 x 90 feet, in which the company intends to exhibit its goods. Both buildings are to be of brick construction and modern in every respect. The ground on which they stand is 125 x 350 feet. The company will also erect an extension to its machine shop, 115 x 300 feet. In addition to this machine shop will be a test room for testing gasoline engines. This room will be 60 x 80 feet. These buildings will be of steel construction. The addition to the machine shop will have electric hoists and overhead cranes, everything about it being of the most modern design.

Miscellaneous

The Cornell Construction Co., Cold Spring-on-Hudson, N. Y., is offering for sale equipment, machinery, etc., of the plant formerly operated by the J. B. & J. M. Cornell Co. at that place. An opportunity is afforded for promptly obtaining valuable machine tools, traveling cranes and foundry and structural shop tools and equipment.



General Industrial

The National Roll & Foundry Co., Pittsburgh, is operating near capacity on mill construction work, the demand for chilled rolls being exceptionally heavy at this time.

Bids have been closed for the buildings of the Duff Mfg. Co., North Side, Pittsburgh, which will require 1,000 tons of steel. The construction work will start in the early fall.

The Sharon Boiler Works, Sharon, Pa., is building two 200-horsepower Morrison water tube boilers for the National Turpentine & Pulp Co., Green Cove Springs, Fla.

The United Refrigerator & Ice Machine Co., Kenosha, Wis., advises that all contracts are in for the addition to its machine room and factory building.

Two furnaces have been reopened recently at the plant of the Moline Malleable Iron Co., West St. Charles, Ill., and nearly a full force of 400 men and women have been employed as a result.

The Hollingshead & Blei Co., of Illinois, has incorporated in Arkansas, with a capital of $10,000, all of which is to be employed in that state. The company proposes to deal in iron, steel and wood products.

The Allyn Engineering Co., Cincinnati, is receiving bids for a factory building, power plant, office building, mechanical equipment, machinery, etc., for the Milwaukee Corrugating Co., Milwaukee, Wis.

The Cleveland, Columbus, Cincinnati & St. Louis railroad has approved plans for improvements at its freight shops at Bellefontaine, O., to cost $178,000. The work is to be started this summer.

Norton Co., Worcester, Mass., has had plans prepared for an office building to be erected at its plant in Greendale, Mass., at a cost of $103,000. It will be of brick construction, 157 x 48 feet, three stories.

The board of trade, Reading, Pa., is considering the offer of M. H. Treadwell, New York City, for re-establishing the iron industry in the vacant buildings formerly occupied by the Stoever Mfg. Co.

The Baltimore & Ohio railroad has awarded contracts for outbound and inbound freight houses at Youngstown, O., each 40 x 400 feet and four stories high, with plans for additions for four more stories to each as occasion requires. The cost is $100,000.

The Buffalo Gasoline Motor Co., Buffalo, is doubling the capacity of its plant. When the improvements are completed the company will add the manufacture of 85 to 125 horsepower, gasoline, marine engines to its line. At present it makes engines of smaller capacity.

The Rockwell Furnace Co., 26 Cortlandt street, New York, is installing one of its large overfired accurate temperature heat-treating furnaces for the New Process Steel Corporation, Lancaster, Pa. The furnace will be used for annealing steel wire, bars, etc.

The United States Steel Railway Tie Co., Pittsburgh, has leased the rights of the Maxey steel tie to the Kiski Steel Casting Co., Avonmore, Pa., which is overhauling its plant and expects to operate on a large scale on its new tie. The plant was closed several months.

The Modern Steel Structural Co., Waukesha, Wis., was awarded the contract for the construction and installation of eight 4-foot steel tainter gates for the Black River Falls (Wis.) retaining wall dam at $6,228. Lewis & McDonald are the general contractors on the project, which involes $225,000.

The Carnegie Institute of Technology, formerly the Carnegie Technical schools, Pittsburgh, is taking bids on the erection of an addition to the machinery hall and tower, the building, 250 x 250 feet, to be of steel, brick, stone and terra cotta. The tower will be of steel skeleton type for a wireless station.

The Miko Machinery & Supply Co., Muncie, Ind., has been incorporated and will deal in machinery and material connected with the manufacture of automobile or vehicle wheels. The capital is $1,000. Directors and officers are Carl D. Fisher, Terre Haute, Ind.; J. M. Heron, Connersville, Ind., and O. B. Bannister, Muncie.

The Melvin-Lloyd Co. has been incorporated with a capital of $10,000, and will go into the foundry business in Youngstown, O. Charles P. Melvin and George P. Loyd, members of the company, own a machine shop in that city, which the new company will continue to operate with the purpose of ultimately starting a foundry.

The Exeter Machine Works, Pittston, Pa., is installing a large coal and ash-handling plant at the power plant of the American Sugar Refining Co., Brooklyn, N. Y. When completed, this system will take care of all operations from the time it unloads the coal from ships at the dock by means of conveyors until the ashes are removed.

The Pressed Steel Truck Co., Pittsburgh, recently incorporated, has placed initial orders for steel trucks for a warehouse and railway station with the Pressed Steel Car Co., that city. The Truck company is not yet ready to manufacture its own trucks. Its offices are located in the Commonwealth building, and C. J. Wilson is in charge.

The Burkett Agricultural Works, Columbus, O., recently incorporated, advises that it will manufacture hay presses, built entirely of iron and steel. Other farming equipment will be manufactured as the business grows. It is the plan of the company to be eventually one of the large plants of the kind in this country. Buildings and equipment will be added from time to time as necessity demands. The company has already completed its office and a part of the buildings, with necessary machinery installed for its present needs. Officers of the company are: President, J. W. Burkett; superintendent, Harry Lowrie, and secretary and treasurer, I. H. Robinson.

Trade Notes

The name of the McInnes-McCleary Foundry Co., Wellsburg, W. Va., has been changed to the McInnes Foundry Co.

Fires

The works of the Detroit Seamless Tube Co., Detroit, were damaged by fire last week, causing a loss estimated at $150,000. The fire threatened other buildings, but was finally subdued.